Bullish 3Com An aggressive road map focuses on security, WAN routing, 10G Ethernet and IP storage. PAGE 15.

GigE: More for less Demand and efficient components are driving down Gigabit Ethernet prices. PAGE 17.

NetworkWorld

The leader in network knowledge ■ www.nwfusion.com

August 11, 2003 ■ Volume 20, Number 32



STEVE STANKIEWICZ

Network director wins funding for major upgrade of San Francisco campus network. Now his team faces tough design issues and tight deadlines.

The network at the University of California, San Francisco, is sprawling, aging, complex, hard to manage and expensive to operate. Or as Chancellor J. Michael Bishop puts it, "UCSF is a first-rate medical institution with a third-rate network."

In this four-part series, Jeffrey Fritz, UCSF's director of Enterprise Network Services (ENS) and a Network World Global Test Alliance member, writes about his experience guiding a multi-million-dollar network upgrade from conception to go-live.

In this first part, Fritz wins funding for the project and comes face to face with several prickly network design issues as he prepares to seek bids.

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NEWSPAPER ■ $5.00

'Big bang' to jolt Microsoft users

■ BY JOHN FONTANA

Microsoft might be hyping its next-generation Longhorn software as a "big bang" event, but the company is being quiet about the fact that the products will require corporate customers to perform multiple, carefully planned upgrades reminiscent of the difficult migration from Windows NT to 2000.

The Longhorn lineup also will wreak havoc with the hardware and software plans of corporate executives, especially those now running Windows 2000 Server, which could reach its early 2007 end-of-support life cycle before the Longhorn server is released.

Longhorn is an umbrella term that Microsoft uses to define its collection of infrastructure software. It's the first step toward integrating all that software around .Net and Web services and requires overhauling the client and server operating systems, Office and everything that runs on top. The integration effort to create a "software stack" aligns with similar efforts by competitors such as IBM with WebSphere and Sun with Project Orion.

"All the desktop products will have Longhorn dependencies," says Peter Pawlak, an analyst with Directions of Microsoft, an independent research firm. It's akin to the Active Directory upgrade. "Microsoft didn't think it would be smooth and it wasn't. With Longhorn, it is going to be one of those unavoidable things. It will make people stop, but to

See Longhorn, page 16

NetWare at a crossroads

Novell's Linux push amplifies doubts about the future of classic NOS.

■ BY DENI CONNOR



"NetWare is not going away, period."

Jack Messman, CEO, Novell

Every time Novell walks a few steps deeper into the Linux arena, someone suggests the company is running away from its NetWare base.

The dynamic was on display last week at LinuxWorld after Novell announced a series of initiatives, including the porting of its GroupWise collaboration product to Linux and the acquisition of desktop software vendor Ximian. The ink wasn't dry on those press releases before Novell executives — who reportedly have had heated debates about NetWare's future — were busy denying news reports that the end of the operating system was imminent.

"NetWare is not going away, period," says CEO Jack Messman. "Novell is not dropping NetWare; we're adding Linux. As we stated in April and again at LinuxWorld, we will make Novell's services available both on a NetWare kernel and a Linux kernel going forward."

Novell this week is expected to begin shipping NetWare 6.5, and company officials insist development is underway on a subsequent version.

However, such statements are unlikely to end speculation about

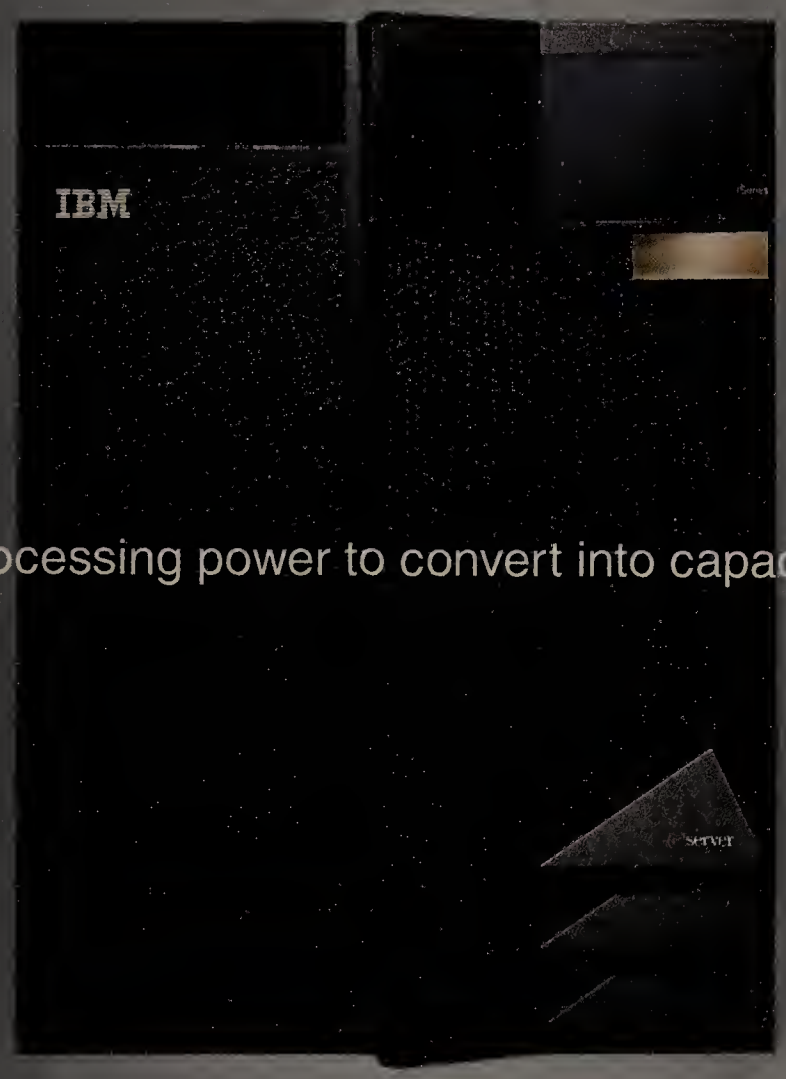
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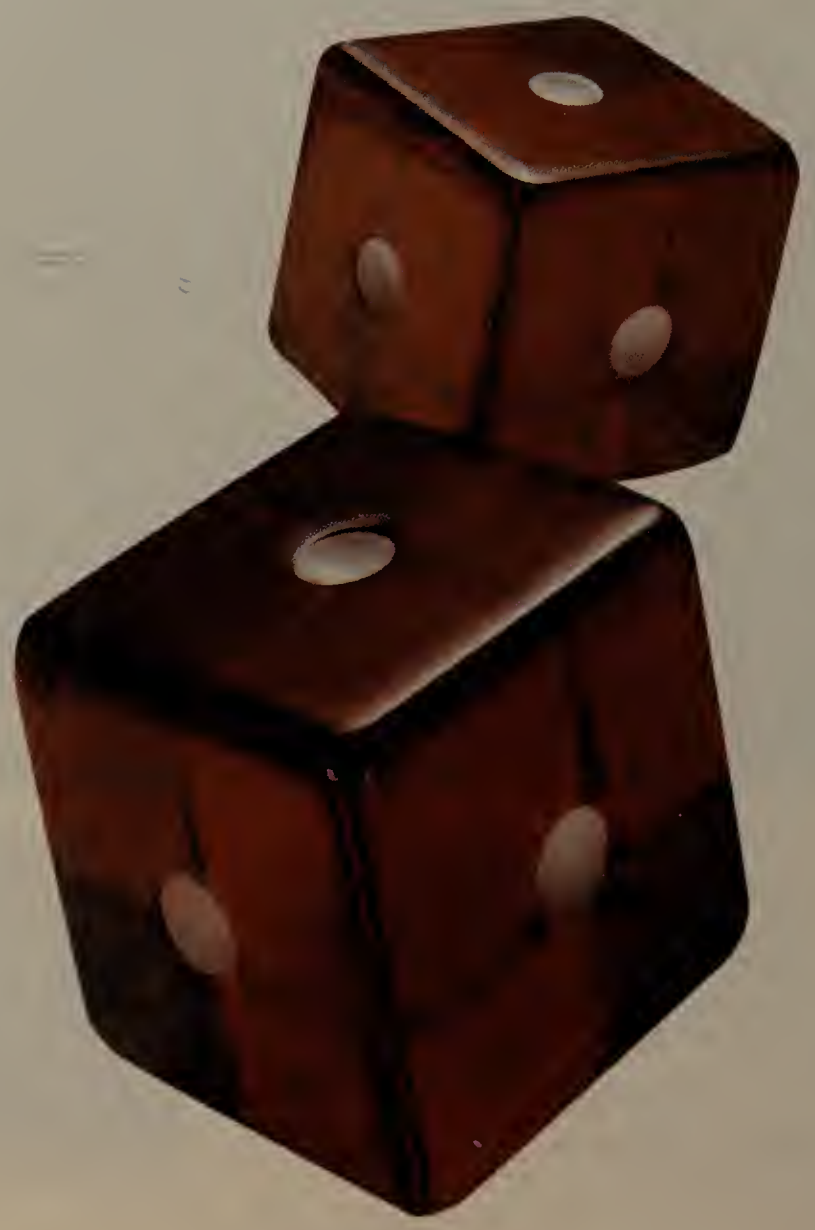


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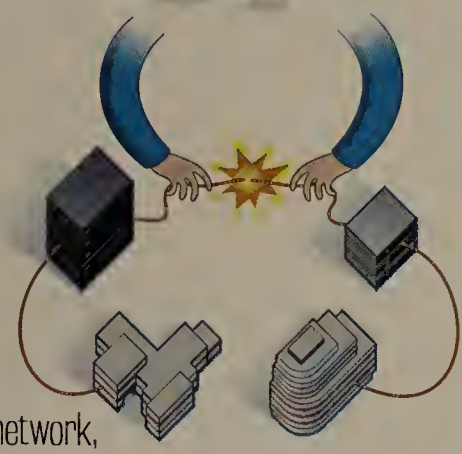
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Features



Inside the UCSF upgrade

The University of California, San Francisco is embarking on a massive upgrade to its campus network, and we've got an inside look. In the first of a four-part series, Jeff Fritz, director of Enterprise Network Services at UCSF and a Network World Global Test Alliance member, describes what needs to be done and how he plans to get there. **Page 40.**

Review: Celerra NS600

EMC's Celerra NS600 offers high-end NAS device features at a mid-range price. **Page 43.**

Product Peek: Confidence Online

WholeSecurity's Confidence Online adds a layer of security for remote Windows clients. **Page 44.**

Review: Catalyst 3750

Cisco beefs up stackable switch family with StackWise technology. **Page 45.**



Technology Update

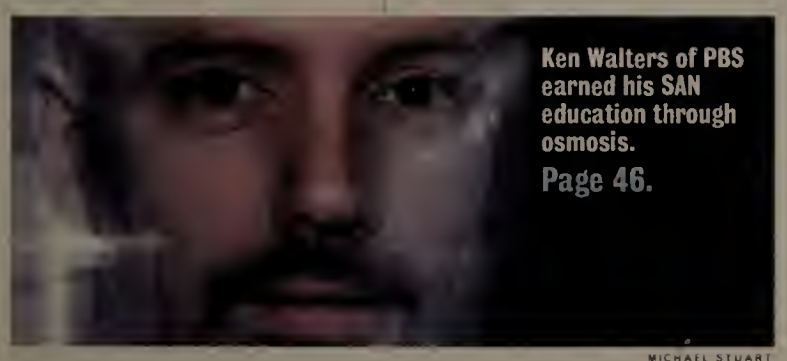
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Ken Walters of PBS earned his SAN education through osmosis.
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MICHAEL STUART

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Cool Tools

Toshiba launches wireless network camera
Senior Reviews Editor Keith Shaw says anyone who buys the IK-WB11a Wi-Fi net camera will get a free dynamic DNS and a unique URL for each of their cameras.
DocFinder: 7133

Wireless apps getting sophisticated

E-mail and calendaring are still the most common wireless apps, but more-sophisticated vertical applications are quickly coming online, Senior Editor John Cox writes.
DocFinder: 7137

Seminars and events

The New Data Center: Powering the Enterprise

The data center is the driving force of the enterprise, rising to take control through consolidation and virtualization, automation and efficiency. If your data center isn't fully metered, accountable and effective, don't miss this Network World Technology Tour event. The event is free to qualified professionals.
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Columnists

Compendium

Spam out his ears
Think you've got it bad? Fusion Executive Editor Adam Gaffin alerts you to one unlucky soul whose spam is spiking on an exponential curve. **DocFinder: 7134**

Wireless Wizards

Preventing 802.11 interference
The Wizards explain how 802.11 (b and g at 2.4 GHz) manages interferences from other technologies such as Bluetooth and microwave ovens. **DocFinder: 7135**

Telework Beat

Good times for virtual call centers
Net.Worker Managing Editor Toni Kistner says firms such as Willow CSN and Alpine Access are winning big clients and expanding business. **DocFinder: 7138**

Small Business Tech

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Columnist James Gaskin offers the dos and don'ts of controlling junk e-mail. **DocFinder: 7136**

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News Bits

SEC approves MCI settlement

■ MCI last week won approval from the court overseeing its bankruptcy case for its settlement with the U.S. Securities and Exchange Commission, the company said. The U.S. Bankruptcy Court for the Southern District of New York approved the settlement, under which victims of MCI's fraud are to receive $500 million in cash and $250 million in shares. The ruling resolves all claims by the SEC against MCI — still legally called WorldCom — for its past accounting practices, the company said. Shareholders, bondholders and other victims will get the settlement proceeds when MCI emerges from Chapter 11 bankruptcy protection, the Ashburn, Va., telecom company said.

Governor orders voting-machine probe

■ Maryland Gov. Robert Ehrlich last week ordered an independent review by Science Applications International Corp., into the electronic voting machines made by Diebold Electronic Systems. The call follows public accusations from Johns Hopkins University researchers two weeks ago that software code believed to be used in the AccuVote-TS touch-screen voting machines was flawed to the point that a single voter could trick it with multiple ballots. Johns Hopkins researchers said the software had been posted to the Internet by an activist. Diebold says the software in question — which Johns Hopkins said is based on Windows proprietary code, working with a smart card — is outdated and was never used in an election. Maryland has made a $55.6 million investment for 11,000 Diebold voting machines and has 5,000 of the machines already in use. Most of the other machines are to be in place before the presidential primary next March.

Survey finds preference for DSL

■ Slightly more than half of dial-up Internet access users would upgrade to DSL service rather than cable modem service if both were available in their area, according to a survey of 7,700 consumers issued last week by J.D. Power and Associates. Although there are many more cable modem users than DSL users today, only 38% of dial-up users said they would upgrade to cable modem service rather than DSL if both options were available to them. Of all Internet access services, dial-up connectivity still dominates, with about 74% of consumers connecting that way. About 17% use cable modem and 9% using DSL.

Microsoft faces hefty fine in Europe

■ The European Commission could fine Microsoft up to 10% of its global annual sales for monopoly offenses, the commission said last week. Microsoft is still committing the monopoly abuses it was first accused of in 1998, the EC said in a preliminary ruling in its long-running antitrust case against the company. The commission has sent an updated statement of objections to Microsoft, reiterating previous accusations that it has leveraged its dominance in the market for computer operating systems into the markets for server systems and media-player software. The latest statement also outlines remedies the commission wants to impose on Microsoft to ensure that competition in these markets is freed up. Microsoft is studying the new statement, a spokesman said. The fact that the commission believes the monopoly abuse is still ongoing makes a large fine likely. Under European Union law the gravity of an antitrust offense is determined in part by how long it lasts. However, it has never fined a company the maximum 10% of sales.

IEEE boosts high-speed wireless streaming

■ Small-business and home users seeking to connect bandwidth-hungry audio and visual devices will appreciate a new IEEE standard for streaming multimedia data over high-speed wireless networks. The new 802.15.3 standard for high-rate wireless personal-area networks (WPANs) lets these networks link as many as 245 wireless fixed and portable devices at data rates up to 55M bit/sec and at distances from a few centimeters to 100 meters.

The standard, which substantially increases the initial 1M bit/sec speed of WPANs, comes in response to strong demand from users, the IEEE says. The standard also addresses user priorities such as network economy, frequency performance, power consumption and data-rate scalability.

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Making a monkey out of you

Forget foreign outsourcing. Primate Programming is a new service: "Recent research in primate programming suggests computing is a task that most higher primates can easily perform. Visual Basic 6.0 was the preferred IDE for the majority of experiment primate subjects." ***Read more at www.nwfusion.com, DocFinder: 7142.***

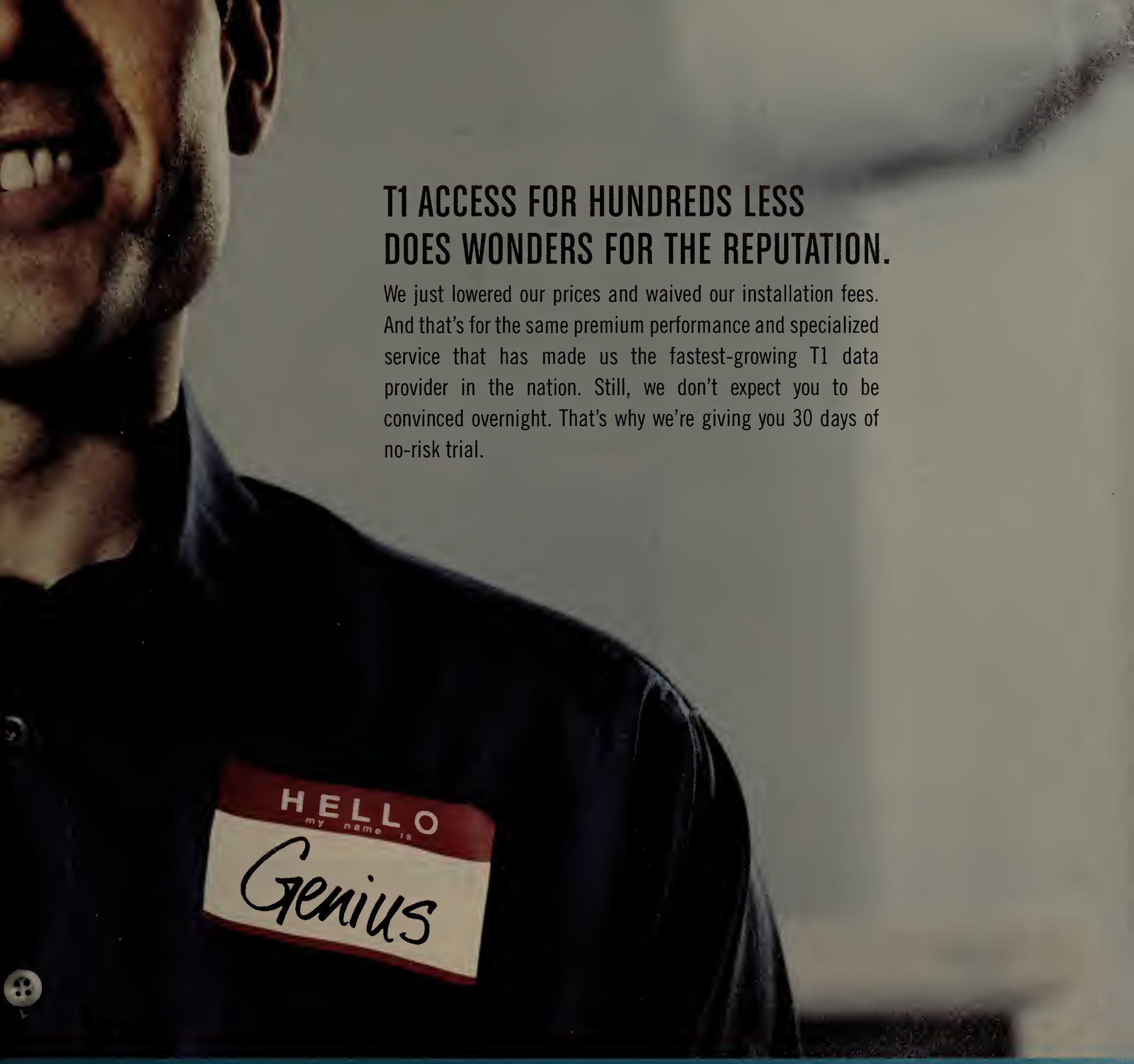
TheGoodTheBadTheUgly



Farmer with a Dell? About half of the 2 million farms in the U.S. are Internet-enabled — nearly triple the figure from 1997, according to a Department of Agriculture survey. Let's hope they aren't letting their pigs online (they can be real bandwidth hogs). ➤

Cell hell. Roughly one in 11 cellular calls suffers from static or other interference, according to a survey of 16,800 wireless users by J.D. Power & Associates. The study also showed that the likelihood of customers switching carriers increases proportionally as the number of network-quality problems rises.

Shunning Sprint. The General Services Administration has warned Sprint that the agency has been urged by its inspector general to bypass the carrier for new contracts because Sprint overcharged the U.S. Department of Justice by more than $2 million from 2000 to 2002 (an error Sprint blamed on a billing problem). The GSA recently took similar action against MCI.



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Start-up aims to clean up data centers

■ BY DENI CONNOR

Entrepreneur Cheng Wu is taking lessons learned about Web content delivery at his last start-up and applying them at his new venture to improve data-center information management.

Wu, who founded content switch-maker Arrowpoint and sold it to Cisco for $5.7 billion in 2000, is now chairman and co-founder of Acopia Networks. Acopia, which takes its name from a Spanish word meaning "to gather together," is building switches that connect application and file servers with storage arrays to provision and dynamically allocate resources based on policies an IT manager puts in place.

Wu says the new company, which is funded with $40 million from Charles River Ventures, Star Ventures, St. Paul Venture Capital, Accel Partners and his own money, will attempt to address the shortcomings of existing data-center architectures.

"In a data center as much as 80% to 85% of the budget is spent in enterprise applications, servers and storage, where those resources become increasingly network-attached," Wu says. "The only way to cut the budget down is by making the network more intelligent. We set out to do a network device that can switch and serve file traffic at the same speed as a network switch can switch packets. That can only be done by virtualizing the network resources."

> **"The only way to cut the budget down is by making the network more intelligent."**
>
> **Cheng Wu**
> Chairman and co-founder,
> Acopia Networks

The company's first product, the ARX6000, connects to a network switch such as a Cisco Catalyst 6000. The device gathers files from heterogeneous storage arrays and file servers into a virtualized data pool so the files can be managed more easily. Applications such as volume management, replication or life-cycle management can be loaded on the switch.

Joe Fuccillo, senior vice president and CTO for a business-continuity services company in the Northeast that has been beta-testing the switch, says it could change the way his company does business.

"We are looking at the switch to cut back on software purchases," he says. "[If you can run applications on the switch], you don't need advanced copy, migration and replication licenses for a lot of the vendors' hardware, which can be very expensive. With it we can have different classes of storage and move data around based on policies."

Fuccillo also is looking forward to smaller switches Acopia has on tap.

"Acopia will have a pizza-sized box," he says. "We are going to have a service for the [small and mid-size business] market and drop it in customer locations, which will then replicate data back to our data centers for disaster-recovery purposes."

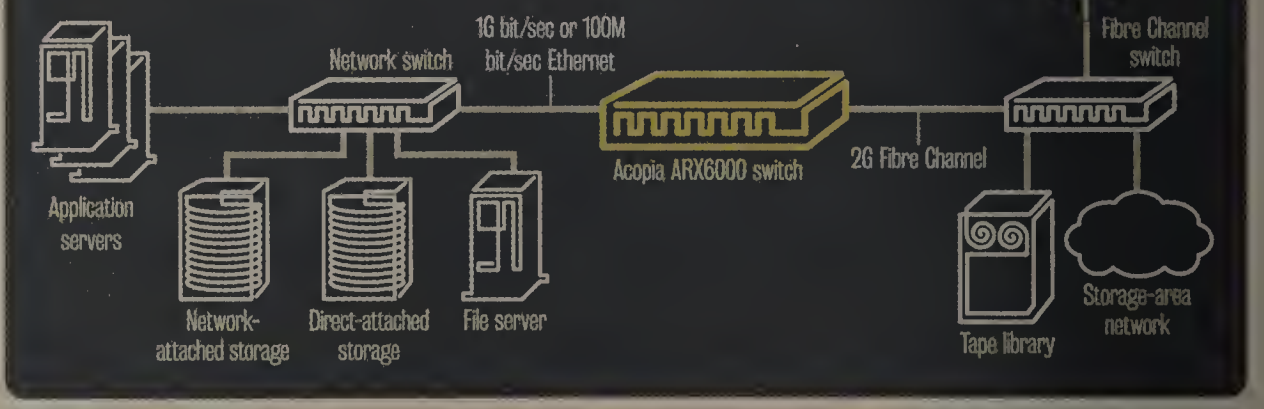
Several companies, including Cisco and Brocade, are vetting Fibre Channel switches that virtualize storage and run applications such as data migration and replication for storage-area network (SAN) data. The products are scheduled for release beginning this fall. Other companies, such as NuView, Z-force and Rainfinity, are aggregating network-attached storage (NAS) data and are currently shipping products.

The ARX6000, unlike intelligent Fibre Channel switches promised from Cisco, Brocade, Sanera, SANdial and Maranti Networks, will attach to NAS and file servers with direct-attached storage and virtualize the files residing on them.

Acopia is providing few specifics on pricing, but says a mid-size switch will probably cost around $100,000. ■

Pooling resources

Acopia's ARX6000 switch sits in a data center between network and Fibre Channel switches, letting companies pool file-based data residing in SANs, NAS and other storage systems. Companies then can better manage that data using provisioning or other applications that reside on the Acopia device.



Aruba boosts wireless LAN management

■ BY JOHN COX

Aruba Wireless Networks this week plans to unveil software designed to give its switch customers more control over wireless LANs.

The software lets companies manage hundreds of access points linked to an Aruba 5000 switch, a wiring-closet device that plugs into corporate networks.

The initial switch release in April carried software for securing WLANs and for doing some device configuration and radio frequency monitoring.

Johnson & Wales University, which is based in Providence, R.I., and has four other campuses across the country, is using the new software programs to set up and manage WLANs at three of its campuses, including the largest one, in Denver. The school has installed a mix of 50 Aruba access points and air monitors (which are simplified access points for scanning radio waves), and on each campus an Aruba switch.

Joshua Wright, the school's senior network and security architect, used Aruba's new RF Plan application with an AutoCAD file of the Denver campus floor plans. With the programs, he created a map of where the Aruba radios should be set up and what their initial configurations should be, such as channel selection and radio power level. All this data resides in an Aruba 5000 switch in Providence.



Aruba's 5000 switch later this month will support advanced WLAN traffic analysis and problem detection.

In Denver, a local cabling contractor used the software's printout to install the Aruba access points, which Wright says then contacted the Providence switch, downloaded the configuration data and began broadcasting as part of the Denver WLAN.

RF Plan is only part of the new software package.

RF Director is the core management application, which now will ship as a standard package on the Aruba 5000. The software creates a GUI through which administrators can get an overview of the WLAN. "I can see things like the number of users associated with an access point, the number of authenticated users who are not associated, and load and utilization patterns," Wright says.

RF Director also is the umbrella application under which run additional management applications from Aruba and third-party vendors. Later this month, Aruba will release a plug-in for WildPackets' AiroPeek NX, which is a program for doing advanced WLAN traffic analysis, problem detection and diagnosis.

Aruba also has two companion applications: RF Lock and RF Analyze.

RF Lock loads on the Aruba switch, with agents running on the Aruba air monitors, which then scan the 2.4- and 5-GHz bands. The software identifies known radios and alerts administrators to unknown radio signals. If a probe detects unauthorized access points or users, it automatically can take certain steps to isolate them.

RF Analyze collects from access points and clients a range of statistical data, such as frame errors, bandwidth rates, packet counts and media-access-control errors. The software graphs the data and sets up thresholds to trigger alerts to administrators.

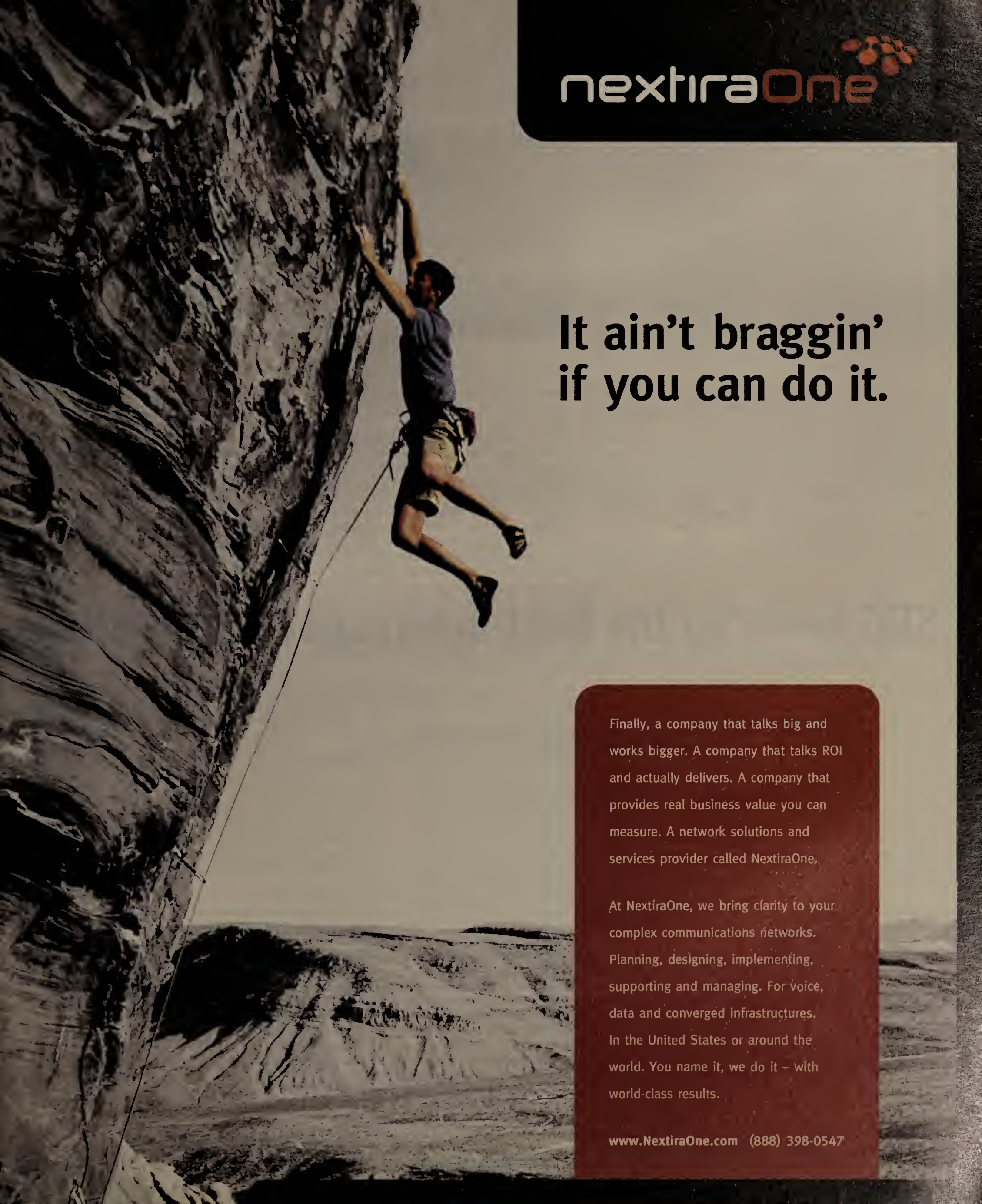
RF Plan costs $2,000, RF Lock costs $10,000, and RF Analyze is priced at $3,000. ■



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Navy unifies its monitoring networks

■ BY ELLEN MESSMER

The U.S. Navy has put its Naval Network Warfare Command in charge of monitoring the Navy's hundreds of different networks used by more than 400,000 personnel around the world in order to detect security violations.

Based in Norfolk, Va., the Netwarcom command group was established by the Navy just over a year ago to coordinate its IT operations and to support the concept of one naval network, with Vice Admiral Dick Mayo as commander.

In its new role of monitoring Navy networks for security purposes, Netwarcom is installing monitoring equipment from Securify that attaches to switches at the edge or inside hundreds of Navy networks. This will involve hundreds of separate Navy networks, including those at the Naval Supply Command, the fast-growing Navy Marine Corps Intranet (NMCI), legacy networks being phased out in favor of NMCI, and the terrestrial and satellite-based network known as Information Technology 21 to reach ships at sea.

By inspecting traffic using the Securify sensors, Netwarcom will be able to determine that only authorized personnel are using restricted services, that appropriate authentication and encryption is in place, and that equipment such as firewalls is properly configured.

"One of the serious challenges faced by the NMCI is the legacy networks, which have serious security problems," says Navy Captain Chris Christopher, deputy director for future operations, communications and business initiatives for the Navy Marine Corps Intranet. While not detailing those problems, he noted that they can be as simple as bi-directional FTP or other services set up by default, creating security risks.

Before Netwarcom took on the watchdog role for the Navy's network security, the responsibility for monitoring fell to local Navy facilities. The centralized approach should help the Navy tighten security, particularly with older legacy networks, Christopher says.

Service time

About 100,000 service personnel use the Navy Marine Corps intranet today. About

360,000

will use it in the next few years.

Netwarcom's new approach through monitoring "is also going to help us understand what we should allow and what we should filter out from our network," he says. NMCI — which is managed by EDS — will be the main network for day-to-day operations in the Navy as older legacy LANs and applications are phased out. "We'll know what we should be quarantining in old networks as we bring applications onto this network."

The Securify equipment allows for policy data to be entered at a Securify SecurVantage Studio console. This would be done by Netwarcom with cooperation from local Navy facilities. Policies can be distributed to the switch-attached sensors, called Securify Monitors, to be installed and maintained locally. EDS will be doing that for NMCI. The Monitors report in real time on traffic behavior to a third piece of equipment, called the Enterprise Monitor.

Through these sensors and monitors, Netwarcom can analyze the traffic at hundreds of naval locations and let management staff at these sites know if there's a need to take a different course to reduce risk.

Securify's sensors look at application and network traffic to spot whether VLANs are set up appropriately for secure communities of interest in the Navy, make sure written security policies are really being implemented, and check whether public-key certificates are being used for all Navy Web servers, as they're supposed to be, says Carl Wright, vice president of federal operations at Securify.

As the Navy gets underway with its effort to get shipshape on security monitoring, it has no immediate plans to coordinate security monitoring with the Army, Air Force or other parts of the U.S. Department of Defense, sources say.

However, the Defense Information Services Agency, which oversees some IT and telecom services for Defense Department agencies, has purchased Securify gear, using it in the Middle East for the Iraqi war effort.

The Air Force and Army also are looking at the security-monitoring equipment, and the potential for coordinated security policy across the services is there, according to Securify. ■

SBC turns up the heat in hot-spot competition

The carrier becomes the latest RBOC to plan a Wi-Fi service rollout.

■ BY JIM DUFFY

SBC last week outlined plans for an extensive Wi-Fi hot-spot rollout, the latest in a series of moves by the regional Bell operating companies to exploit the wireless technology to give remote users or frequent business travelers high-speed access to corporate data.

The carrier also said it is creating an integrated Wi-Fi and 3G wireless service to deliver broadband wireless offerings to home, business and remote users.

As part of the new Wi-Fi service, to be called FreedomLink, SBC plans to deploy more than 1,000 Wi-Fi hot spots in several hundred venues in its 13-state region by year-end, and says it will have more than 9,000 hot spots in 2,000 venues by year-end 2004 and more than 20,000 hot spots in 6,000 venues by 2006. The company will continue to deploy hot spots in hotels, airports, convention centers and other venues after 2006.

The integrated Wi-Fi/3G service is expected to be available in late 2004 or early 2005.

RBOC plans

SBC has the most aggressive plan to date among the Bells for rolling out Wi-Fi-based services.

RBOC	Wi-Fi plan
BellSouth	Offers a home network service that uses Wi-Fi; has not announced a hot-spot coverage plan.
SBC	Under FreedomLink, the carrier intends to roll out 20,000 hot spots at 6,000 locations over the next three years.
Qwest	Has not divulged a Wi-Fi plan, though observers say the company might resell Sprint PCS's Wi-Fi service.
Verizon	Says it will turn up 1,000 Wi-Fi hot spots in Manhattan by the end of the year.

SBC did not disclose its investment in this effort. It said expenses would be minimal, however, because it is utilizing existing network assets.

In addition to establishing hot spots at primary venues, SBC said it also plans to provide a turnkey product that lets small businesses become a hot spot to differentiate themselves in the marketplace. The businesses then would offer Wi-Fi access to their customers, similar to what Starbucks and McDonald's are already doing through other service providers.

Wi-Fi refers to any wireless LAN product that's based on the IEEE 802.11 WLAN standard with theoretical data rates ranging from 11M to 54M bit/sec.

To augment its Wi-Fi plan, SBC has reached a roaming agreement with Wayport, a leading Wi-Fi service provider. The agreement will give SBC customers access to Wayport services in more than 650 locations nationwide, including 565 hotels, eight airports and 75 restaurants.

To give subscribers access to more hot spots, SBC says it also will pursue roaming agreements with other Wi-Fi service providers.

Wayport is becoming the Wi-Fi roaming partner of choice for the RBOCs. Verizon Wireless last week said it is teaming with Wayport to offer customers up to 650 Wi-Fi access points at hotels, convention centers and airports across the U.S.

For its effort, SBC plans to use its public telephone infrastructure to establish access points and use SBC DSL or T-1 service to transport data from the access point to the network.

SBC will use its relationship with wireless operator Cingular to bring an integrated Wi-Fi/3G service to market. The service will let subscribers move between their home or office SBC broadband service, SBC FreedomLink Wi-Fi hot spots and Cingular's network, the carrier says.

SBC and Cingular currently are working on a way to allow roaming between home and office LANs, Wi-Fi hot spots and the Cingular network. This would let subscribers receive broadband Internet access regardless of where they are, SBC says.

Pricing for FreedomLink will be announced when the service becomes available.

Senior Editors John Cox and Denise Pappalardo contributed to this story.



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LinuxWorld bustles despite SCO flap

IBM files counterclaim accusing SCO of patent infringement.

■ BY JENNIFER MEARS

Any suspicions that The SCO Group's legal battle over Linux would put a damper on corporate adoption of the open source operating system were pretty well laid to rest last week at a bustling LinuxWorld show featuring major systems vendors touting their latest Linux wares.

Analysts attending the event say the show floor was as crowded as ever and the focus was increasingly on Linux's role in corporate data centers.

"If there was a theme, it was likely that it's time to take Linux in the enterprise seriously. A subtheme was that enterprise Linux isn't just about lower acquisition costs or [total cost of ownership] anymore — it's also about performance, reliability, stability, and real business benefits and ROI," says Michael Dortch, principal analyst at the Robert Frances Group. "Curiously, no one with whom I spoke with at the show even mentioned the SCO lawsuit, and no one seemed to care when the subject was placed before them."

Not that the issue was completely ignored. Red Hat and IBM both filed legal actions against SCO last week as the Linux community stepped up its defense against SCO's claims. The filings came as SCO unveiled pricing for its UnixWare licenses, which it says will protect Linux users from copyright infringement. The license starts at $699 for a single-CPU system.

The ever-widening legal scuffle began in March when SCO filed a $1 billion lawsuit against IBM alleging that the company had incorporated purloined Unix code into Linux. SCO later amended that action, upping the amount of damages it was seeking to more than $3 billion. The company also said it was terminating IBM's Unix license and sought compensation from IBM's AIX business. AIX is IBM's version of Unix.

On Wednesday, IBM filed a counterclaim in U.S. District Court in Salt Lake City stating that SCO is in violation of the General Public License (GPL), which governs how open source software must be shared. In the action, IBM also accuses SCO of infringing on four IBM patents and says SCO improperly claimed the right to revoke its AIX license.

Supporting the latter claim are two letters from Novell CEO Jack Messman, which sold the Unix System V code to SCO in 1995. The letters say that SCO does not have the right to terminate the IBM license.

Earlier in the week, Red Hat filed a complaint against SCO in federal court in Wilmington, Del., to "hold SCO accountable for its unfair and deceptive actions."

Red Hat held a press conference on the opening day of LinuxWorld to announce the filing. At the same time, Red Hat launched the Open Source Now Fund, which it says was created to help defray legal expenses associated with defending infringement claims SCO has leveled. Red Hat pledged $1 million to the effort.

In response to the week's activity, SCO reiterated its claims and said it would continue to defend its intellectual property rights.

"As the stakes continue to rise in the Linux battles, it becomes increasingly clear that the core issue is bigger than SCO, Red Hat or even IBM. The core issue is about the value of intellectual property in an Internet age," SCO said in a statement. "If IBM were serious about addressing the real problems with Linux, it would offer full customer indemnification and move away from the GPL."

Despite the increasingly heated battle with SCO, LinuxWorld attendees said the issue did little to diffuse the focus on corporate deployments of Linux.

"Looking at the products and technology on display this year, I am struck by the attention being given by exhibitors and attendees to management, security and clustering products as vendors attempt to deliver solutions that will let Linux servers — today generally concentrated in the one- to four-CPU range — address very large computing problems," says Richard Fichera, Giga Research Fellow at Forrester Research.

IBM and SuSE Linux, for example, announced that SuSE's Enterprise 8 Linux software had achieved an international security accreditation, making it secure enough even for national defense IT systems (see story, page 18). Dell, meanwhile, announced it would ship its low-end Power-Edge servers with Red Hat Enterprise Linux ES.

As expected, Veritas introduced clustering tools for IBM DB2, MySQL and Oracle databases that it says will increase recovery and availability of those applications running on Linux. Veritas also announced that its Foundation Suite storage software is now available for users running Linux on IBM mainframes. And HP and IBM both announced Linux-based clustering products and said their network management software products are now more Linux-friendly.

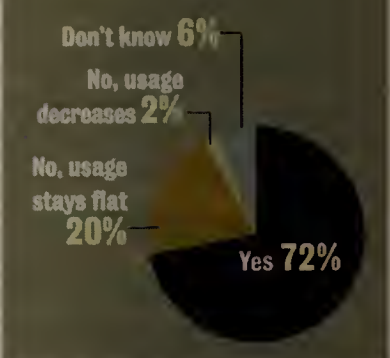
Other news at the show included:

- Novell's acquisition of Ximian, which makes management and desktop software for Linux.
- Sun's demonstration of its open source desktop for Linux, code-named Mad Hatter.
- An announcement from BEA Systems, Dell, EMC, HP, Network Appliance, Novell, SuSE, Unisys, Veritas and VMware that they have teamed to give support to corporate Linux users as part of the Technical Support Alliance Network. ■

March to Linux

Last week's LinuxWorld reinforced the operating system's growth into data centers. A recent Forrester Research study that queried 50 IT executives at companies with at least $1 billion in revenue reflects that trend:

"Are you planning to increase your Linux usage in the next two years?"



HP upgrades blade lineup

■ BY JENNIFER MEARS

HP has upgraded its line of blade servers with faster Intel processors and rolled out a new 24-port Gigabit Ethernet switch that the company says is designed to let users more easily incorporate blades in networked environments.

Among the upgrades is a new low-power-consuming blade that employs Intel's Pentium M processor, a low-power, high-performance chip originally designed for notebook computers. The ProLiant BL10e blade server is built on a 1-GHz Ultra Low Voltage Pentium M processor and includes a 1M-byte Level 2 cache and a 400-MHz front side bus. Pricing starts at less than $1,800.

The HP ProLiant BL20p server has been upgraded with two 3.06-GHz Xeon DP processors, 1M-byte Level 3 cache and a 533-MHz front side bus. Pricing starts at about $5,500, and the blade with a Fibre Channel card for SAN connectivity starts at $6,500.

The four-processor BL40p blade, meanwhile, now comes with either 2.8-GHz Xeon MP processors and a 2M-byte Level 3 cache or 2.0-GHz Xeon MPs and a 1M-byte Level 3 cache. Pricing for the 2.0-GHz blade starts at just more than $8,000, while the 2.8-GHz blade starts at a little more than $17,000.

HP also announced that its ProLiant BL GbE2 Interconnect Switch has been upgraded with a new 24-port Gigabit switch module Nortel designed. The switch, which also supports Fibre Channel, comes after HP first announced SAN connectivity for its blades in January. Pricing for the switch will be announced next month.

Looking forward, HP plans to enhance connectivity among the blades and will support Layer 3-Layer 7 switching, as well as 10 Gigabit Ethernet, says James Mouton, vice president of industry-standard server platforms at HP. "We'll be looking at more sophistication around virtual LAN capabilities and controls where you can move a server in or out of a given pool of servers," he says.



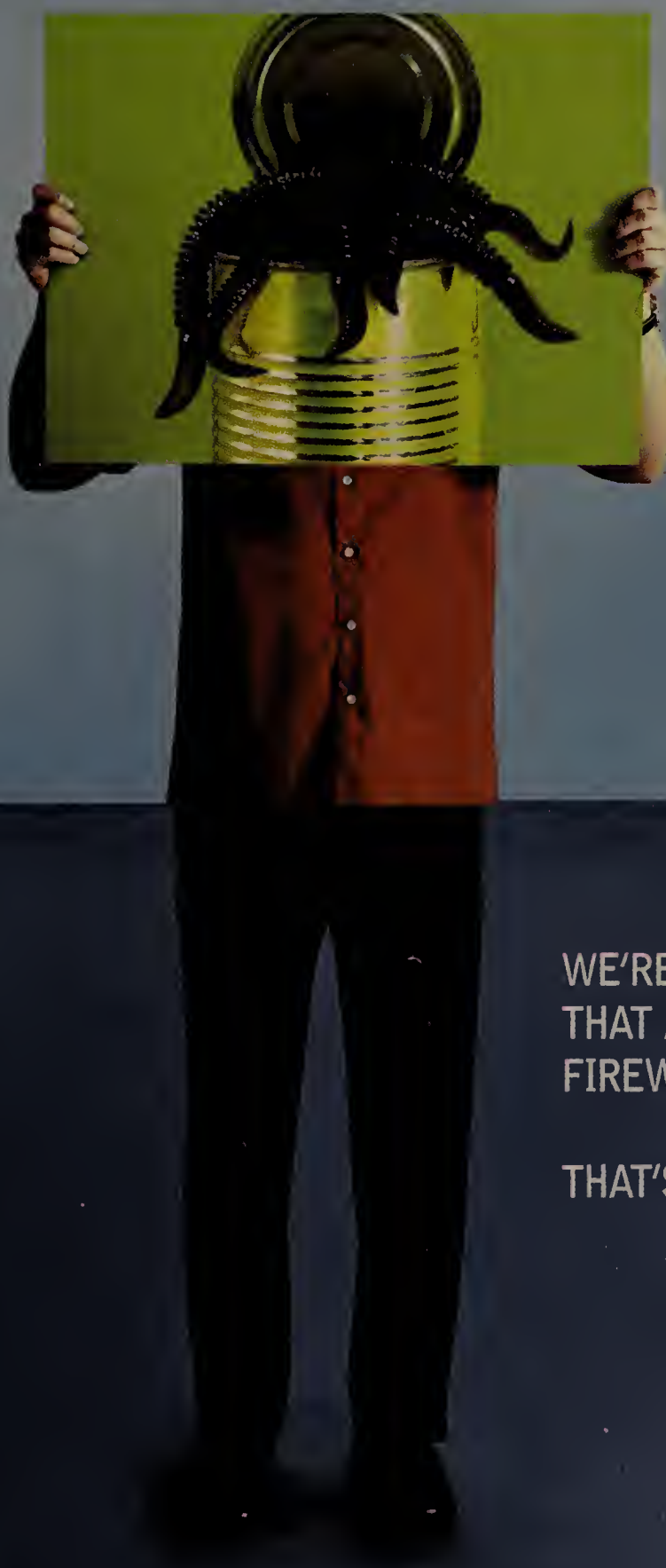
HP has boosted the performance of its blade server line, including the BL20p, which now is powered by two 3.06- GHz Xeon processors.

One user says the continued enhancements to HP's blade lineup let him make broader use of blade systems within his data center.

"We've standardized on blades and we intend to buy nothing else," says Eric French, network manager at the Greater Baltimore Medical Center, which recently scrapped three full racks of servers for one rack of 30 HP ProLiant BL20p blade servers. "Two things made that possible: one is the 2p blades are Fibre Channel attachable now so we can attach them to the SAN, and the 40p gives us the capability to have quad processors."

RLX Technologies and Engenera were the first to market with blade servers, but last year major vendors such as IBM, Dell and HP unveiled their own blade products. Sun introduced its first blade server earlier this year. HP's announcement shows that blades are "starting to mature and go mainstream," says Illuminata analyst Gordon Haff. ■

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NetWare

Continued from page 1

a product that has seen market share plummet in recent years along with Novell's overall fortunes. This turmoil only reinforces the notion that NetWare's still sizable installed base is at a crossroads. The options for customers are clear: Stay the course with an operating system that might not be supported far into the future; wait and see if the company's promises to move NetWare services to Linux pan out; or make the leap and migrate all their services to Windows.

Sources say Novell's management was sharply divided this spring over the decision to keep developing on the NetWare kernel while migrating its services to Linux or to announce an end-of-life schedule for the once-dominant network operating system.

"Novell was almost ready to announce an end-of-life for NetWare and say it was serious about Linux by killing NetWare," says a former employee who took part in the discussions and asked that he not be named.

The parallel development approach won out.

However, some observers continue to doubt that Novell will release another version of its operating system after NetWare 6.5.

"When push comes to shove it's going to be all Linux because it's just too expensive to maintain two engineering, test and support groups," the source says.

Novell's focus was certainly on Linux last week with the Ximian acquisition and news that its GroupWise collaboration platform would be ported to Linux, with a beta test slated for next month.

Many Novell products already run on Linux, including eDirectory, ZENworks, iFolder and its Volera Excelerator caching software. The company recently said that Nterprise Linux Services — software that gives customers file, print, messaging, directory and management services and runs on Red Hat and SuSE Linux — will be available by year-end. NetWare 6.5 also includes support for the Apache Web server, MySQL open source database and PHP, the Web scripting language.

But Novell still relies on the sale of NetWare product licenses for about 30% of its revenue, and isn't sure that the potential for Linux revenue is comparable. Red Hat, which dominates the Linux market, reports overall revenue is that only about one-quarter of the $361 million Novell generated last year from NetWare alone.

NetWare customers generally express a mixture of contentment and caution when discussing the product.

"Yes, we're happy with Novell and have no plans to get rid of [our NetWare servers] for now," says Jim Mapes, a network administrator with Knape & Vogt, a specialty drawer manufacturer in Grand Rapids, Mich. "I wouldn't go so far though as to say we'll keep them as long as Novell is around."

Knape & Vogt uses NetWare for file and print, and Windows for e-mail, databases, Web and financial applications.

"At this point we are going to continue to use NetWare," says Scott Ficek, director of IT for Mesaba Airlines, a regional airline in Minneapolis. Ficek has 25 NetWare servers.

Most users say that if Novell were to end NetWare they would pay for a migration to Linux or Windows.

"We would be willing to pay for the [NetWare] services that would be ported to Linux, especially the NetWare kernel," says Jeff Johnson, systems software engineer for Georgia State University in Atlanta. Johnson has 92 NetWare 6 and 5.1 servers.

Otis Lamar, systems administrator for the Jefferson County government in Golden, Colo., says, "If Novell services will run on Linux, we will look at migrating to Linux in the future and would be willing to pay for it." He already is looking at Linux as an alternative to Windows.

"We do not expect Novell to give away the services for free, since we already pay for them on other platforms," Lamar says.

Another problem for Novell is that NetWare's dwindling market share hurts its ability to attract application developers. Linux is the fastest-growing operating system, according to IDC, having shown 41% growth from late 2001 to the fourth quarter of 2002. NetWare commanded almost 40% of the network operating system market during its heyday in the early '90s, but has only in the neighborhood of 10% today. While Novell counters such doom and gloom by noting that there are 4 million NetWare servers installed serving 90 million users, the perception persists that developers are indifferent.

"We are under increasing pressure to drop NetWare in favor of Windows servers due to an increasing trend among vendors to stop writing software for NetWare," says Jeff Durfee, IT manager for Milton J. Wood Co. in Jacksonville, Fla.

Novell's prospects for reversing that trend are cloudy, experts say.

"When I talk to the software and hardware community, support for NetWare is in line after Windows and Linux," says John Enck, research director for Gartner. "So when they write management agents and device drivers, NetWare support isn't off the spec, but it's pretty far down the list."

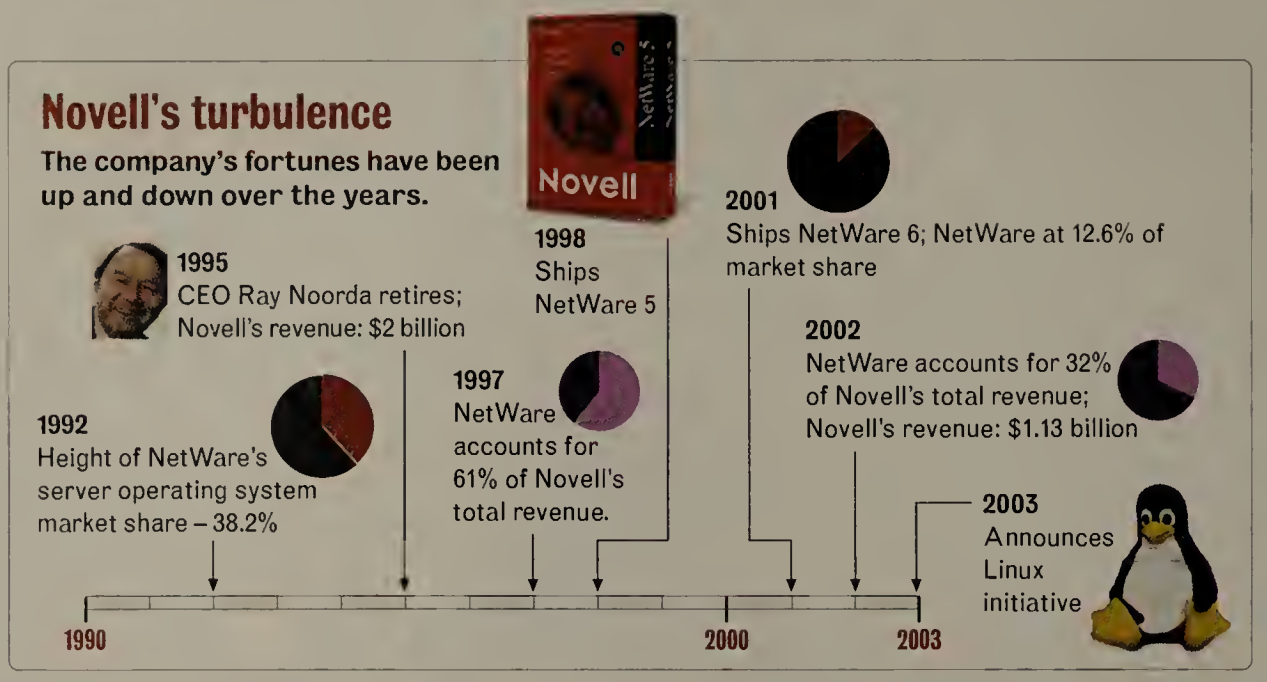
However, another industry observer sees hope in Novell's new strategies.

"At this point we are going to continue to use NetWare."

Scott Ficek
Director of IT, Mesaba Airlines

"I'm not completely sure Novell is going to remain irrelevant," says Al Gillen, research director for IDC. "The company's Nterprise Linux Services initiative raises some interesting possibilities for them. Most importantly, it gives them an application server platform."

"It also makes more sense to the hardware vendors because they are looking to sell more Linux as well," Enck says. "If you look at the deployment of Linux in the enterprise, it's still the early days, so there's still opportunity for Novell to make a play there. Novell has a shot at it, but it would have been better two years ago." ■



Proficient device aims to pick best VPN route

■ BY TIM GREENE

Proficient Networks is introducing a low-cost appliance that is designed to let customers direct VPN traffic to the best Internet connection at sites with more than one Internet link.

The box, called NPE210A, is a scaled-down version of Proficient's NPE510A device, and is priced to attract customers that have site-to-site VPNs whose performance they want to improve. Picking the best route for VPN traffic requires a Proficient device at each site, making it important to keep down the price of outfitting each office. Previously, customers had to use the NPE510A, which cost $30,000, but they now can buy an NPE210A for $9,000.

Proficient's appliances fall into the class of route-control equipment that plugs into corporate LANs and monitors performance on Internet access lines to determine which link is giving the best performance. Then, based on policies that take into account the performance of the Internet connections and the price of the connections, the devices can divert traffic to one Internet connection or another.

For instance, if the latency on two links is within 50 millisec, the NPE could be set to pick the less-expensive link. But if the latency difference is more than 50 millisec, the NPE could pick the faster, regardless of cost.

Other vendors in this area include Sockeye and netVmg. NetVmg makes the FCP 50R for small offices that monitors traffic to 50 destinations and costs $12,000.

To optimize the performance of site-to-site VPNs where each site has more than one Internet connection, both ends of the connections have to be tended by a route-control device. Because most VPNs are between smaller branch offices and larger headquarters, equipment for smaller offices don't need to have as much capacity as equipment for larger headquarters.

NPE210A tracks performance for up to 100 destinations, which Proficient says should be enough for a branch office. NPE510A supports up to 5,000 destinations.

The entire NPE line has been certified by Check Point to integrate with its VPN-1/Firewall-1 software. This certification means the NPE equipment can be monitored and managed from Check Point's management platform. ■

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3Com CEO bullish on being Cisco alternative

■ BY PHIL HOCHMUTH

3Com CEO Bruce Claflin says there is a void in the market for enterprise network infrastructure — an absence of an alternative to Cisco. And he intends to fill the gap.

To do this, 3Com is plotting a road map of new products and technologies — security, WAN routing, 10 Gigabit Ethernet and IP storage — that it will roll out over the next six to 12 months, along with software and tools to make it all work together.

In a market where Cisco dominates every major subcategory, from basic LAN/WAN gear to wireless, security and voice over IP, shooting for second place won't be seen as a lack of ambition. But industry watchers say 3Com, along with its joint-venture partner Huawei Technologies, will face challenges in a crowded field.

The joint venture with Huawei is one of the key elements of 3Com's enterprise comeback bid, after the company stopped making high-end network gear in 2000 because of low profit margins. The Huawei partnership — announced in March and due to be complete in October — already has yielded its first product with 3Com's Switch 7700, a box competing with Cisco Catalyst 4000 series.

Claflin says 3Com will continue to launch products over the next year that will go up against Cisco's core Catalyst 6500 box and Cisco's WAN access routing products, such as its 2600-series routers.

He also is bullish about Huawei's Versatile Routing Platform (VRP), a competing software product — Cisco and others call it a clone — to Cisco's Internetwork Operating System (IOS).

Claflin adds that plans are in the works to incorporate VRP into existing 3Com products, as well as future 3Com/Huawei gear.

VRP is the focus of a suit Cisco filed against Huawei in February for what it claims were copyright and intellectual property infringements. Use of code from Cisco's IOS in Huawei's VRP software was among the charges. (Last month, when a critical flaw in IOS was found, several security firms warned that VRP-based Huawei routers might be susceptible to the same bug.) In its suit, Cisco sought to have Huawei products barred from sale in the U.S., but such an injunction was not granted. Huawei removed the disputed code from its software, but the case is ongoing.

Claflin says VRP violates no intellectual property rights and that the joint venture will push forward with product integration. He adds that other 3Com intellectual property, such as IP voice and its Extendable Resilient Networking — a high-speed switch interconnect and failover technology — also will be fitted into Huawei-based gear sold by the joint venture. Joint research-and-development efforts also are underway between the partners to develop gear that can handle storage traffic, such as iSCSI, as well as 10G Ethernet technology for connecting high-end switches.

It is with such joint R&D endeavors that Claflin says 3Com can leapfrog competitors.

Another advantage, Claflin says, is Huawei's China-based engineering team costs a fraction of what a U.S. company might pay its own R&D group. This results in more engineers working on projects at a lower cost than competitors, he says. This also allows switches and routers produced by the joint venture to be brought to market more quickly, with the finished products being more robust and reliable.

"[Huawei] can change the rules of the game," he says. "They have a cost structure that's fundamentally different than Western companies."

Citing a research report from Merrill Lynch, Claflin says there is no single supplier in the minds of enterprise customers that is a product-for-product alternative to Cisco.

"I view that as a positive," he says "because of all my competitors none has a clear advantage over us. But we've still got a lot of work to do."

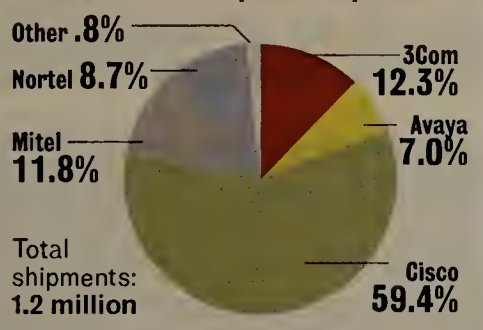
Industry watchers are skeptical, putting emphasis on the work the company needs to do to achieve its goals.

"They'll have good opportunities outside North America," says Lawrence Orans, principal analyst with Gartner. "But here in North America, there's still a bad taste in the mouth of ex-3Com customers regarding the way they exited the [enterprise] business" in 2000. "They're going to have to prove themselves in places like the Asia-Pacific region and offer some jaw-dropping prices before making a big comeback here." ■

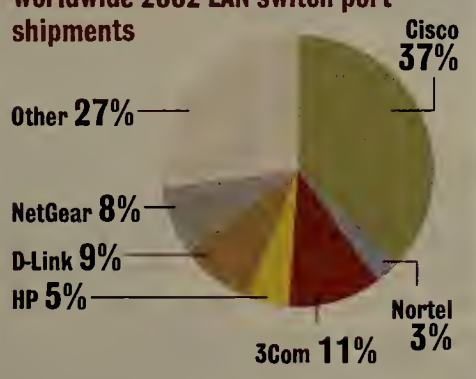
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Worldwide 2002 LAN switch port shipments



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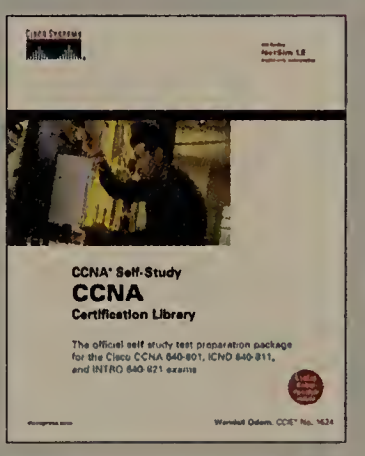
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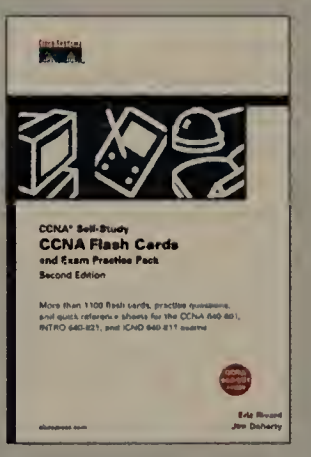


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HP, IBM and Sun back Tripwire

■ BY ELLEN MESSMER

Security vendor Tripwire is spearheading an effort to develop an Internet-based database where companies could store information that would help them check for unauthorized file changes.

HP, IBM and Sun last week voiced support for the nascent standards effort, the so-called file-signature database, not expected to be completed until next year. As planned, the file-signature standards database, named Tripwire for Servers, could hold unique "fingerprints" of millions of files from many companies and likely be based on established standards such as Simple Object Access Protocol and XML standards.

A fingerprint is a digital hash of a file or operating system that provides a unique mathematical representation. If a file is changed, its fingerprint will look different. Tripwire products check for file integrity by comparing old and new file fingerprints.

In a joint commercial venture, HP, IBM and Sun are working with Tripwire to foster the design for the database on the Internet to hold file fingerprints. Customers could store file fingerprints and remotely access them, as an alternative to storing them in-house.

"It could simplify my life greatly," says John Freeman, senior process control systems engineer at Bayer Pharmaceutical in Shawnee, Kan., which has deployed Tripwire for Servers on several of its most critical Sun and NT servers. Bayer Pharmaceutical now stores in-house the signature hash of files used for periodic data-integrity check. But the option to use a trusted party's Internet-based service for this would eliminate the need to store file-signature data. ■

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Longhorn

continued from page 1

move the technology forward they have to do it."

The Longhorn "wave" (as Microsoft calls the set of products) will include a dramatically new client, with integrated universal data storage called WinFS. It also will include a chip-based security model formerly called Palladium; a user interface overhaul; a new application model built around an API called Avalon that supersedes Win32; and improved communication and collaboration features based on a Web services framework code-named Indigo.

Longhorn also will have a corresponding server to support WinFS and new management capabilities, among other features. It will include an Office upgrade built to take advantage of the new API; upgrades to Microsoft's CRM and ERP applications; new versions of Visual Studio .Net development tools, code-named Orcas; and a range of server software from collaboration to electronic commerce, Microsoft says.

Details about those products are sketchy because Microsoft is still trying to define their feature sets.

However, sources say Longhorn will include a full-scale, identity management infrastructure, which Microsoft started to preview in July and is expected to expand upon in October at its Professional Developers Conference.

Also expected is integrated peer-to-peer technology in the client and server that will support patch- and virus-update distribution, and real-time project tracking. It is also expected that Longhorn will enable collaboration and secure document sharing outside the firewall. Integration of IPv6 to enhance security also is planned.

Early efforts with peer to peer and IPv6 are being bolted onto Windows XP and offer a glimpse of the type of feature packs and piecemeal upgrades that Microsoft plans, before and during the Longhorn upgrade to jump-start migration. Microsoft did a similar jump-start with Windows Server 2003 by releasing early public-key infrastructure and Exchange 2003 schema changes that were needed in Active Directory.

In a forthcoming report, Gartner says it expects Microsoft to deliver at least three, and possibly five or more, "server feature packs" and limited-edition offerings between Windows Server 2003 and the Longhorn server.

Bill Gates, Microsoft chairman, chief software architect and steward of Longhorn, said recently that "Longhorn should drive a whole range of upgrades." And foreshadowing the technological shifts brought on by Longhorn, he said, "virtually everything at Microsoft is synchronized to build on this platform."

Sources close to Microsoft describe the transition to Longhorn only by saying that something major is going to happen. Microsoft officials declined to comment.

It's a grandiose scenario Windows users know all too well.

"It's what you get used to," says Jeff Allred, manager of network services at Duke University Cancer Center in Durham, N.C. "But I'd like for things to stay stable for a while. I won't worry about this now, but I'll be thinking about it."

Corporate users won't see the Longhorn client until 2005 at the earliest, when it is expected to ship. A developer preview is scheduled to be available in October and the first beta late next year.

A time frame has not been set for delivery of the rest of the "wave" of Longhorn products.

The vagueness regarding the timing fuels migration questions for users. While the Longhorn client is expected in 2005, Gartner predicts that the server will be released sometime between mid-2006 and 2007. That means users who upgrade the client would be without features such as WinFS that rely on the server.

"You don't get all the goodness until you have deployed the Longhorn client, server and Office upgrade," says John Enck, an analyst with Gartner. He says Microsoft might look to one of three options: a Longhorn server beta that can be used in test environments; a limited edition of the server that supports WinFS; or retrofitting WinFS support into Windows Server 2003. He says the final option is highly unlikely.

"You won't see Microsoft overcommit on Longhorn server features," Enck says. "This will not be another huge upgrade. They need to stay conservative so they can hit the dates."

Hitting the dates, if they are within Gartner's prediction, is the reason corporate executives should be mapping out future plans.

Win 2000 will hit its end-of-support life cycle in 2005. Extended support, which costs extra, would stretch support to March 2007. If the Longhorn server ships before that 2007 deadline, it would be a natural upgrade path.

Anything later, however, will leave Win 2000 customers in the same boat Windows NT users are in today with an outdated and soon-to-be unsupported operating system.

"Planning is tough," Enck says. "It's good that Microsoft has published the life-cycle road map, but the bad thing is that they have had trouble delivering." ■

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Big bang

Microsoft says it expects to roll out its Longhorn products over a number of years as the company upgrades its software to match its .Net and Web services strategy.

Strategies

- Shift its software portfolio to a foundation built on .Net starting with a dramatically new Longhorn client operating system.
- Upgrade its server operating system and server applications as well as develop a range of new products to take advantage of the .Net core.
- Work on unifying code to create better integration between products in its software portfolio.

Challenges

- Dependencies on Longhorn will require upgrades to Office, something that could slow the adoption of both client operating system and Office versions.
- The upgrade cycle for customers could be long and tedious.
- Competitors such as IBM, Sun and BEA Systems also are building unified software stacks.

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GigE switches drive more-for-less trend

User demand up while smaller, more-efficient Gigabit components help bring switch prices down.

■ BY PHIL HOCHMUTH

As Gigabit Ethernet pricing continues to free-fall, the technology is finding its way into corporate networks where 10M bit/sec hubs once might have served small workgroups.

Recent products from vendors such as D-Link Systems, Linksys, Netgear and SMC Networks continue to push the more-for-less trend in network switches. Two engines drive this trend: increasing demand for faster LAN links; and smaller, more efficient LAN switch components from network silicon makers.

Since 1999, Gigabit Ethernet pricing has dropped from the $1,100-per-port price range to an industry average price of about $400 per port. This estimate includes copper-based fixed-configuration Layer 2 Gigabit boxes and high-end fiber-based Gigabit ports with advanced features.

The push toward Gigabit Ethernet to the desktop is driven somewhat by new applications, such as streaming media and IP telephony. Demand also comes from specialized or vertical markets with end users who work with large files or use specialized applications that utilize lots of bandwidth.

According to a *Network World* survey of 500 IT executives, almost two-thirds of the respondents said Gigabit Ethernet is already in their networks, while another 30% said it will be in the next two years.

Aperio, a San Diego company that designs equipment for digitizing microscope slides, uses Gigabit desktops to handle unusual bandwidth requirements.

"When we were setting up the network, we realized we'd be moving huge images around, and that this would take a long time with" 10/100M bit/sec Ethernet, says Ole Eichorn, the firm's CTO. He adds that many of the images sent across the network are so large that if they were printed in pieces on a standard printer, "it would

See Gigabit, page 18

Short Takes

■ **Sun** is updating the processors on its **Sun Fire V480 server.** Now the company's rack-optimized server will be available with 1.05-GHz UltraSparc III processors, an upgrade from the 900-MHz models that Sun had been shipping. This upgrade will give the machines a 22% boost in performance, Sun says. Sun markets the V480 as a low-cost, entry-level system. It is the last of the Sun Fire servers to be upgraded to Sun's 1.05GHz chip. Pricing for the V480 will remain unchanged. A dual-processor machine with 4G bytes of memory will list for about $20,000. A four-way, 16G-byte machine costs $43,000.

■ **NuView** is launching a version of its storage management software that will include data life-cycle management capability, snapshot backup and byte-level replication of data. **StorageX 4.0** lets administrators manage and move data across heterogeneous devices based on criteria such as age, size or data type. It also gives users the capability to back-up data via snapshot technology and replicate only the data that has changed. Pricing for StorageX starts at $2,000 per managed device.

■ **Gateway** last week rolled out its first four-way server in an attempt to win over more business customers. The **Gateway 995** will be available with up to four Xeon MP processors from Intel. The base configuration costs about $6,000 with a single 2.0-GHz Xeon MP processor, 512M bytes of double data-rate memory, a dual-channel Ultra SCSI controller and a 36G-byte hard disk.

XIOtech ups magnitude of storage

■ BY DENI CONNOR

XIOtech last week announced a new version of its Magnitude storage array that the company says lets users cluster disk drives and storage controllers across geographic distances for increased availability and fault-tolerance.

Magnitude 3D is a modular storage array that can be broken into individual components and clustered — disk bays and drives can be separated from the storage controllers that handle disk I/O. The arrays can be placed as far as 328 yards apart over Fibre Channel connections.

As drives are added to the array, the data on them is aggregated into a virtual pool of data. If a controller fails, its workload is redirected to the remaining controllers. When new drives or controllers are added to the cluster, they automatically become active and their data is added to the pool. Each cluster of two controllers can support as much as 32 terabytes of data. XIOtech says next year the size of the cluster will increase to 16 controller nodes.

Gary Porter, senior engineer for St. Vincent Hospital and Health Services in Indianapolis, beta tested the XIOtech Magnitude 3D. "We have about 8 terabytes in the new 3D," he says. "The controllers can be geographically separated for high availability. If one controller goes down, we don't have any downtime, any blips or packet failures."

Most storage vendors, such as competitors EMC and Hitachi, make storage arrays in which the controllers, drive bays and disk drives have to be housed in the same chassis.

"The Magnitude's controllers can be in separate chassis, separate data centers, even in different parts of the country," Porter says. "You can add controllers for more throughput and horsepower. It allows flexibility and scalability no one else can do."

In addition to the availability and fault-tolerant advantages of Magnitude 3D, clustering occurs without any additional software on the server and with any Windows, Linux, Unix or NetWare operating system. As a result, acquisition and server operation costs are reduced.

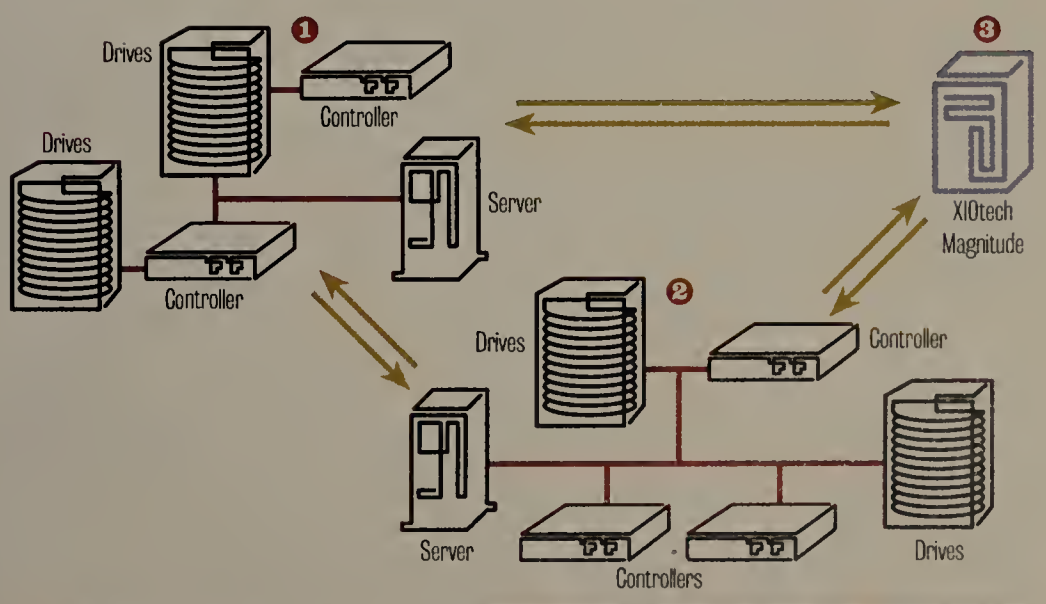
Magnitude 3D can be added into networks with XIOtech's existing Magnitude storage arrays.

A two-terabyte configuration that includes all software to enable clustering costs $135,000. ■

■ HOW IT WORKS

XIOtech's Magnitude 3D architecture

By clustering their storage arrays over distances of as far as 328 yards, users can increase the availability and fault-tolerance of their storage systems.



1 In a Magnitude 3D cluster, disk bays and drives are separated from the controller. Data on the drives is virtualized into a single pool. If a controller fails, data automatically is reassigned to another controller in the cluster.

2 Geographically separate drives and controllers can be added to clusters for availability and fault-tolerance.

3 Existing XIOtech Magnitude arrays can be added into any cluster.

WIRED WINDOWS

Dave Kearns



The competitive spirit lives

Everything these days appears to be a competition. Not only in sports (Red Sox vs. Yankees, Manchester United vs. Barcelona and so on) but in politics (California Gov. Gray Davis vs. 200-plus people who want to replace him), and even high-tech business (PeopleSoft's Craig Conway vs. Oracle's Larry Ellison). We're so attuned to competition that we see it where none exists.

The other day I was speaking with Phaos Technology CEO Roger Sullivan, catching up on the company's tool kits that support the Liberty Alliance identity-federation specification. I asked him about Liberty's spec vs. the recently introduced WS-Federation specification (part of a series of Web Services specifications IBM and Microsoft are launching in a bid to control the next stage of computing). After first giving me the obligatory support speech ("Phaos, as a technology provider, will support all protocols our clients want to support"), Sullivan said the two offerings are not that competitive and that it's quite possible to support one with the other.

WS-Federation, as befits a specification from two high-profile tech leaders, is heavy on the technology of federation but completely ignores the business case. The Liberty Alliance, on the other hand, originally articulated a strong business case with a lot of "we'll fill in the blanks later" about the technology. For example, Liberty only specifies the Security Assertion Markup Language (SAML) as its transport mechanism. On the other hand, WS-Fed supports SAML, Kerberos, x.509 certificates and Extensible Rights Markup Language — and it easily can be extended to other methods.

But WS-Federation has nothing to say about the agreements, trust and liability that federation brings to the various parties in a transaction, while the Liberty Alliance (consisting mostly of organizations in the business-to-consumer and business-to-business space) has a series of well-thought-out scenarios and recommendations for the business agreements that are a necessary part of identity federation.

Sullivan says he believes that eventually a combination of the two specifications might be what succeeds in the real world. There's certainly nothing in the Liberty specification that would disallow following WS-Federation in terms of transport and security mechanisms while relying on the business "best practices" ideas in the alliance's specifications.

Competition has its place — on the playing field or in the boardroom — but when it comes to standards and specifications, we'd all do well to adopt a more cooperative attitude.

Kearns, a former network administrator, is a freelance writer and consultant in Silicon Valley. He can be reached at wired@

Tip of the Week

If you write Java code and you want to be involved in **secure identity management,** then you need to visit Phaos' Web site and check out its tool kits for identity and security, especially the Liberty Alliance Toolkit and SDK.

Gigabit

continued from page 17

be like covering a tennis court with magazine pages."

Gigabit network interface cards and integrated 1000Base-T ports have become essential items for most server vendors. And recently, major PC manufacturers — including Apple, Dell, Gateway and HP — have started offering point products or whole lines of PCs with integrated Gigabit Ethernet interfaces built into the motherboard.

"It's amazing how prices have dramatically come down," says Matt Queen, systems administrator with Standridge Color, a plastics manufacturing company in Greensboro, Ga.

This price drop let Standridge rebuild its network with switches from Dell. All switches now have multiple Gigabit uplinks to the core, which runs Gigabit over fiber. This bandwidth boost didn't break the company's bank and let it look at new applications for the network, Queen says.

"The reason we looked into [Gigabit] is because we wanted to do [voice-over-IP] apps," Queen says. The Gigabit core supports an IP-enabled PBX running over the LAN and a paging system for the shop floors that runs over the Ethernet network. Bandwidth utilization has yet to be an issue, he adds.

Although smaller players have entered the Gigabit Ethernet market aggressively, this segment is still very much a Cisco world. Cisco owned 60% of the 7.4 million Gigabit ports shipped in 2002. And 3Com and D-Link came in second and third with 7% and 6% of the market, respectively. While 3Com has made a recent push to appeal to Cisco's customer base of large corporations, D-Link remains focused on smaller shops and the consumer market. Observers say the appeal of D-Link Gigabit products to the masses is a sign of commoditization in the Gigabit LAN switch market.

Part of this move to lower-cost products comes from more efficient design and component fabrication techniques from companies that enterprise customers usually don't deal with directly.

"A number of different things have changed and are still changing" in the Ethernet component realm that lead to lower-cost gear, says Jim Muth, product line manager for Gigabit Ethernet systems at Broadcom. Muth's firm makes many of the components and silicon that go into switch vendors' products. He points to two main factors that drive down cost — size and heat.

Many key components in copper-based Gigabit Ethernet switches are now one-third the size they were when the technology was introduced in 2000, Muth says. This lets more physical ports be packed together tighter, making the overall products less expensive.

"Anytime you can shrink a component," he says, "that will help you out on your cost."

He adds that copper-based Gigabit switches also run much cooler now, which helps keeps pricing down for two reasons. Going from 5 watts of power down to 750 milliwatts — common for today's components — means less-expensive power supplies are necessary. Plus, with less heat, fans can be shrunken or removed — another factor leading to a smaller price tag, Muth says. ■

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How low can GigE go?

The average price for a Gigabit Ethernet port (including modular and non-modular switch prices) continues to drop.



SOURCE: IDC



D-Link's DGS-1008D (top) and SMC's SMC8612T both offer Gigabit Ethernet for less than $100 per port.

IBM, SuSE secure Linux with Fed certification

■ BY JENNIFER MEARS

Linux took another step in its evolution last week when IBM and SuSE Linux announced that the open source operating system had achieved an international security certification used by the federal government.

At LinuxWorld in San Francisco, the companies announced that SuSE Linux Enterprise Server 8 running on Intel-based IBM servers had achieved a Common Criteria security certification. Common Criteria is an internationally recognized standards organization created to develop criteria for IT security. To earn Common Criteria certification, products must meet strict standards in areas such as development environments, security functionality, how security vulnerabilities are handled, security-related documentation and product testing. IBM has been shepherding SuSE through the Common Criteria process.

A year ago, the National Security Agency mandated that all national security systems use Common Criteria-evaluated products, but has since relaxed that directive because of the dearth of accredited products. Instead, vendors whose products are used for national security systems must commit to getting their products through Common Criteria testing (see related story at www.nwfusion.com, DocFinder: 7132).

With the certification, Linux joins a handful of products that Common Criteria has approved. The certification "will be a critical factor as Linux is applied to mission-critical environments," says Fritz Schulz, a computer scientist at the Defense Information Systems Agency.

IBM and SuSE are not the only vendors working on Evaluation Assurance Level (EAL) certification. In February, Red Hat and Oracle announced plans to certify Red Hat Advanced Server, a project that is expected to be completed in December.

Linux vendors previously had avoided EAL certification because the cost is prohibitively expensive, running somewhere between $500,000 and $2 million, says Michael Rasmussen, an analyst at Forrester Research. But, he says, new U.S. government regulations are making Common Criteria certification an increasingly important requirement for government contracts. "All of the federal government, including civilian agencies will have to buy Common Criteria products within the next 24 months," Rasmussen says.

SuSE Linux Enterprise Server 8 on IBM eServer xSeries earned an EAL 2+ certification, and IBM and SuSE say they have filed for a higher level of security certification and expect to achieve that later this year.

The IDG News Service contributed to this report.

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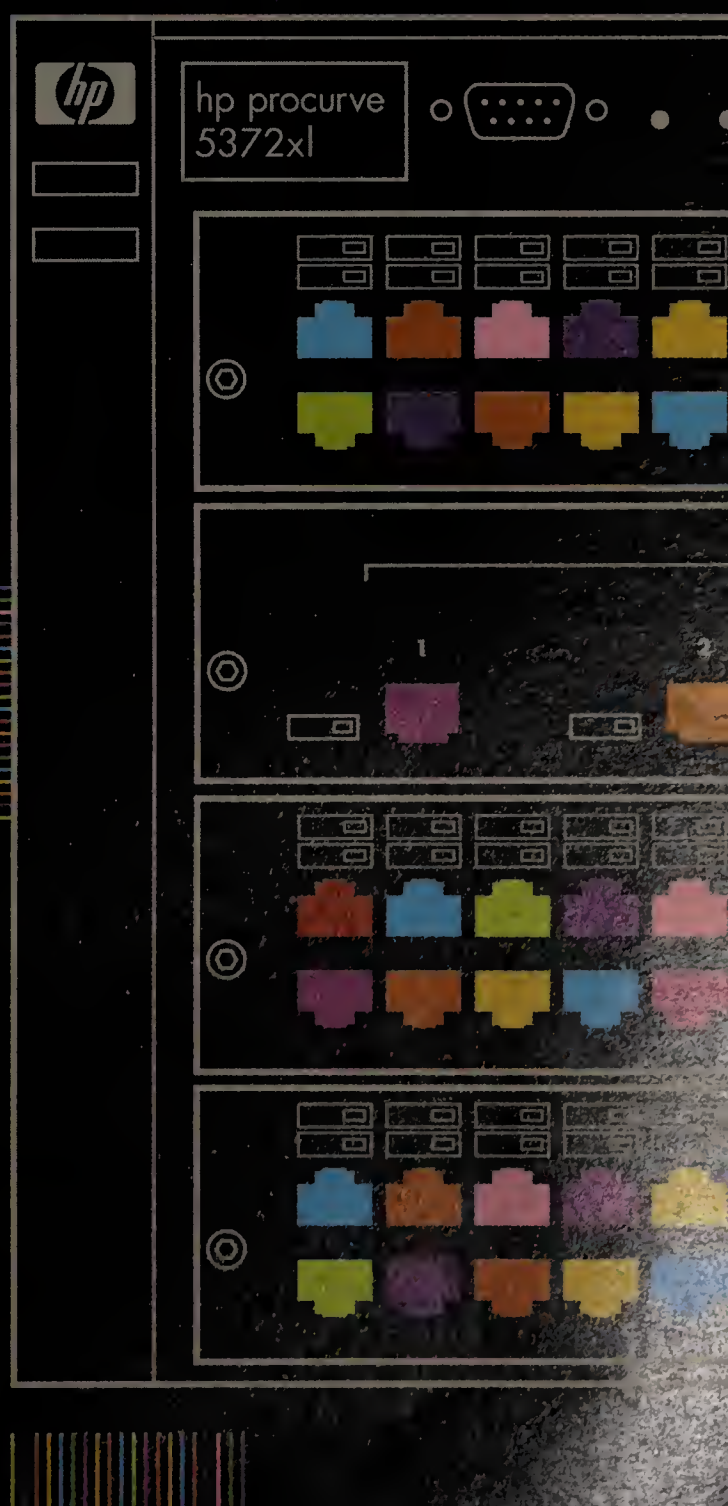
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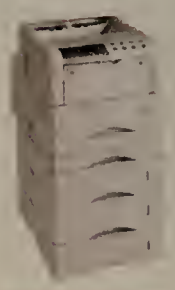


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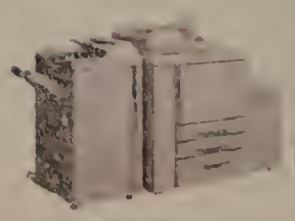
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Q A Research exec helps IBM bring projects to reality



Since the inception of its first lab in 1945, IBM Research has grown to fill eight worldwide labs, employ about 3,500 researchers — including five Nobel prize winners — and help Big Blue become an IT innovator and market power across several technology disciplines. IBM's research executives credit the company's vast user community with helping the computer heavyweight determine product road maps. This week IBM will discuss its global technology outlook at SHARE's semi-annual IBM users conference in Washington, D.C., which is expected to draw about 2,000 participants for more than 700 hours of technical education sessions covering a range of IBM technologies. Network World *Senior Writer Denise Dubie sat down with Robert Morris, director and vice president of IBM Research, to discuss how his team determines where to find tomorrow's technologies.*

Tell me a bit about what key technologies you're working on at IBM Research.

I run the Almaden [Calif.] research center. We work on nanotechnology, such as the very basics of our capabilities in physics and chemistry that allow us to be leaders in the microelectronics business. And we put those technologies together to form components. We also do research on how the components are assembled into systems.

In terms of systems, one of our major focus areas here now is on storage systems. We are building self-managing storage, which will continue to lower the cost of storage. Then on the next level up, we work on data management technologies, which of course includes databases, but it also means data mining and exploiting the Web. Above that we have a lot of work going on for Web technologies. Also we do work on the user experience, making sure that our systems interact well with people. Finally we perform research on how people interact . To really serve the services part of IBM's business, we have basic research going on regarding how people interact, how they communicate, how they collaborate and how we can improve the interactions between people as they solve IT problems. We like to say it's from atoms through to society.

See Morris, page 22

Short Takes

■ When **Microsoft** releases **Office 2003** it will give certain Office Standard Edition users the right to order Office Professional Edition applications at no extra cost and offer a Step-up License to upgrade to the full Office Professional suite. Both offers apply only to volume license buyers who bought a right to upgrade to Office 2003 Standard Edition from earlier editions, either through Software Assurance or its predecessor, Upgrade Advantage, Microsoft says. Microsoft hopes the offers will entice customers to switch to the more expensive Office Professional Edition, but also aims to satisfy customers who might have been unpleasantly surprised by the vendor's move announced earlier this year. The Step-up License will be sold from Sept. 1, 2003, until Sept. 1, 2004. Microsoft did not offer such a license upgrade option in the past, forcing customers who wanted to upgrade to buy a completely new license.

Start-up aims to safeguard Web servers

■ BY ELLEN MESSMER

Start-up MagniFire WebSystems this week plans to announce TrafficShield 2.0, an updated version of its application firewall that the company says will help customers prevent break-ins into Web servers.

TrafficShield 2.0 will add a number of new defenses, including the ability to block hackers attempts to change their ID and privileges after authentication — known as dynamic-parameter tampering. The package also can prevent database harvesting, an attack using automated scripts to slowly extract information or cause a denial-of-service attack.

TrafficShield 2.0, which supports 100M bit/sec or Gigabit Ethernet connections, is typically installed as a reverse proxy in front of the HTTP-based Web servers to be protected, either in a data center or behind the firewall. TrafficShield can block known Web worms and unidentified worms based on suspicious activity.

It can block an attack known as "forceful browsing" in which a hacker turns to input-related tricks from a browser to gain illegal access to Web content through invalid input. TrafficShield also detects other trickery, such as cookie poisoning, hidden-field manipulation and stealth commanding, such as SQL injection.

START-UP COMPANY

PROFILE: MAGNIFIRE WEBSYSTEMS

Started:	2000 by Mark Sahaf and Michael Shafir.
Located:	Tel Aviv, Israel, with U.S. offices in New York City.
Funding:	$9.1 million from Jerusalem Venture Partners and Lucent Venture Partners.
Number of employees:	30
Product:	MagniFire TrafficShield application firewall.

The appliance monitors the Web site to detect changes and analyzes the changes to suggest policy-update recommendations, which can either be applied automatically or with administrative approval.

"We have an automatic process that's like a crawler that goes over the application to understand the JavaScripts and applets, looking at flow parameters," says MagniFire CEO Eitan Bauch. "Every day you add a line of code you open yourself up to new vulnerabilities." However, TrafficShield can't monitor traffic when VPNs are used to access the internal network and applications directly.

At least one user was impressed with TrafficShield's ease of use.

"The first day we installed the product, we were able to see a graphic display of our entire Web application. It was amazing. We could see every entry point, every legal user interaction for the first time. Our developers were very impressed by that," says Elbling Zvi, infrastructure and technology manager at Bank of Jerusalem, which has used TrafficShield since January to protect an online banking application.

With its research and development roots in Israel, MagniFire sold the first version of TrafficShield mainly to Israeli and European corporations, but with an office now in New York, the start-up is prepared to market the $25,000 TrafficShield 2.0 to U.S. customers as well, Bauch says.

MagniFire competes against Kavado, NetContinuum, Sanctum and Teros in the application firewall arena. Some customers using the MagniFire appliance say it can be somewhat easier to configure a security policy because it has a spidering mechanism to "map" the application it is intended to protect. ■

'NET INSIDER

Scott Bradner



More of life under observation

Some people think the Internet could be a wiretap-free zone. While that might be nice, don't hold your breath.

"Legal intercept," the more accurate but more complex term for wiretapping by law enforcement organizations, has been around in the telephone business since day zero. But currently, the legal picture of wiretapping Internet communications is quite muddy.

It is arguably the case that the major U.S. law dealing with legal intercept, the 1994 Communications Assistance for Law Enforcement Act (CALEA), does not actually provide a clear legal foundation for wiretapping some types of Internet communications. For example, people who should know what they are talking about have predicted that the U.S. government would lose a test case trying to apply CALEA to voice over IP (VoIP). But that does not mean the FBI agrees with that analysis or will avoid asking for VoIP intercepts.

In March, the FBI and the U.S. Department of Justice expressed their views in response to an FCC request for comment about regulating VoIP. But, even if the courts were to rule that CALEA does not cover VoIP and other Internet applications, I cannot imagine Congress not passing a new law in very short order in these days of anti-terror fervor that would make the authority to wiretap unambiguous and, probably, far too easy to invoke. So I expect that any freedom from monitoring we might think we have will be fleeting, if ISPs have not been cooperating fully with surveillance requests for quite a while now.

But a number of recent news reports have me quite puzzled. It looks like the FBI wants to go about the business of being Big Brother in the most illogical way. The reports are that the FBI wants VoIP service providers to execute the surveillance. This makes very little sense. VoIP runs as just another application over the Internet — it's just bits — thus, anyone, even the bad guys, can be a VoIP provider. Does the FBI want to have to go to, and trust, thousands of individual VoIP service providers to get the tapping done?

Additionally, the basic architecture of VoIP is such that the packets carrying the voice do not pass through any central server, so there is no central place to monitor them. All other Internet-based applications also are just bits over the 'Net and anyone can set up a server. It is illogical to approach monitoring from the server side.

The only logical approach is to do the monitoring in the Internet access network (see www.nwfusion.com, DocFinder: 7225) for an example of how this can be done). This is not to say that I'm fond of the idea, nor is this meant to say that history has shown that all government authorities are always trustable. But it is the only logical way to do what, the laws will say, must be done.

Still, I fear the alternative is laws that tell ISPs to restrict who can run servers and to put restrictions on the permitted service architectures — that would destroy the Internet and hand it over to the phone companies, the folks who know how to work in that kind of environment.

Disclaimer: Harvard predates, and I fully expect will outlast, the phone companies. It has not expressed an opinion on this topic.

Bradner is a consultant with Harvard University's University Information Systems. He can be reached at sob@sobco.com.

Q A

Morris

continued from page 21

How does IBM decide what to research, what becomes a product, and what doesn't?

We are very careful to maintain a balance between free-ranging basic exploratory research and undirected research on the one hand, and on the other hand, research that is very intimately tied to customer and product requirements. We spend a lot of time making sure that we balance these. If you do just one or the other, you will fail.

If you only respond to customer needs, you will become an advanced technology shop, you will join up the dots and you will be ultimately unable to invent a disruptive technology. And if you only do basic undirected research, you will miss, because no research institution, no matter how good, will catch every trend. And even if you have those two, you're not guaranteed success. You have to fill in the in-between. There's a kind of a middle third, a middle area of pre-product. That's developing things that after a bit of research you realize and hope one day could become a useful technology or product.

What has IBM recently passed down to the research group in terms of product direction?

The biggest activity is a really new mission within IBM of transforming information technology into an on-demand capability, which of course has a variety of aspects. Some people think of that as the making of IT available as a utility; and it certainly includes that, but it's much more than that. It's about transforming the whole IT operating environment. And over and above that, it's about transforming business.

Where did the on-demand vision originate?

This is not something that is kind of a big bang. We're not going to say, 'This is when we'll launch our first and our last on-demand product.' If you go back a year and a half, one of the things we were talking a lot about was autonomic computing, and we're still working really hard on that. It is one of the first ways we began to discover this on-demand movement. CIOs, through hearing and learning about the technological requirements of autonomic computing, told us that that computing environment, the on-demand enterprise, is something they'd like to see.

It turns out that autonomic computing is the technology heart and soul of on-demand. It is the technology skeleton on which on-demand is built.

Autonomic has actually been going on for several years, and we didn't start on-demand several years ago. Our products had been component-autonomic even prior to that. We are now working toward being, to make up a definition, systems-autonomic or holistically autonomic now.

Could you elaborate on how autonomic or on-demand research has found its way into IBM products?

To start where the human touches the technology, one of the most noticeable parts of that is using the client. In the PC arena, our ThinkPads and ThinkCenter desktops are well known, and within those we have created the autonomic client

An example of autonomic is the way our systems are self-managing as they connect into the network. Our ThinkPads now ship with a technology called Access Connections, which automatically connects the client into the network that is there. You don't really have to reconfigure at any time. And new technology we're working on, which will come out fairly soon, will also automatically optimize your connection.

What about security?

Naturally, that has to go hand-in-hand with security technology. We're working on a wide range of security technologies, including an embedded chip within our ThinkPad. That allows clients to store keys and do an embedded security-system capability so that all of the files can be automatically, on-the-fly encrypted when they are stored. So if you should lose your machine, the files are quite safe.

We can do a biometric authentication to our ThinkPads as well. And we make that available because we recognize that the way people connect with these very complex back-end IT systems is mostly through a client like a ThinkPad.

How does IBM translate this type of security into wireless environments?

We are extending that technology now. Basically, the way you used to locate rogue access points was with a handheld sniffer, which you had to walk around the building with to find rogue access points. But now we've extended that technology to the point where every client, every machine, whether it be a desktop or a mobile, that is in the enterprise or on the campus, can participate in that. You don't have to have that sniffer anymore.

This is called Distributed Wireless Security Auditor. From any machine that's on our network it can triangulate, find rogue access points and then automatically go in and shut them down.

How do user groups such as SHARE affect what IBM research develops?

It affects us in a couple of ways. Primarily it allows us to listen. Twenty years ago in IT you told people, 'Look at our new technology,' and then got their reaction to it. Today it's been reversed. Today you listen.

People in our company from the CEO down to researchers are out talking to customers from their CEOs to their network, database or storage administrators. It's what led to this on-demand movement. We just kept hearing from our customers that they needed to be able to work with a variable base instead of a fixed base because of the change in their industry. We heard that they had to be much more resilient toward disaster. Whether it was a market change or a disaster, we heard them say they needed to be more flexible. ■



More online!

Read the unabridged version of the interview with Robert Morris where he talks about how IBM targets research at vertical markets.

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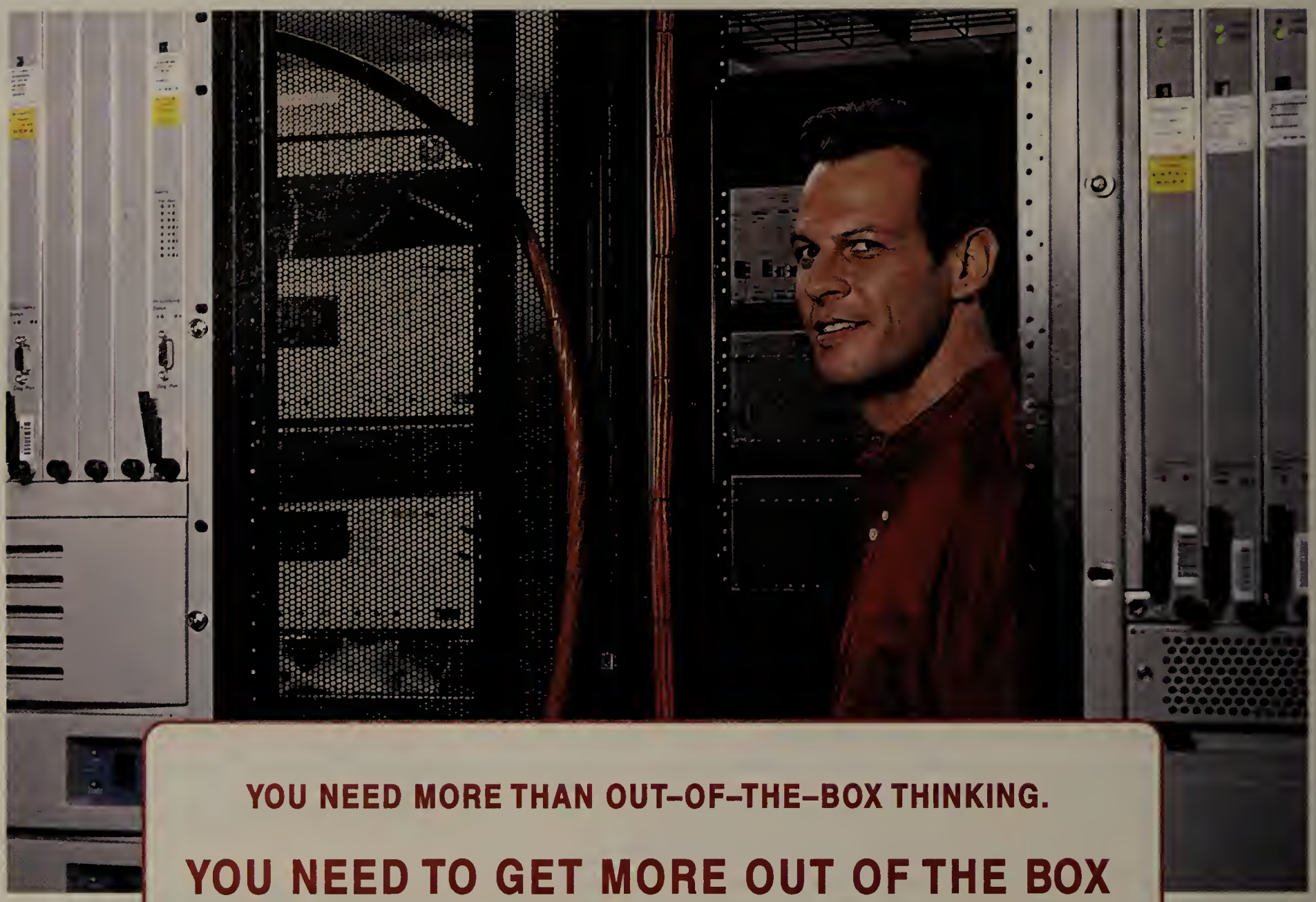
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Q A Visual CEO looks to brighter future



Visual Networks, maker of packet-network performance-monitoring hardware and software, is slogging through tough times. The company sold only $9.7 million worth of equipment in the second quarter, down from $15.2 million in the same quarter last year. The company needs quarterly revenues of $11 million to become profitable, it said in a recent financial-disclosure statement to the Securities and Exchange Commission. If the company doesn't take in that much, it might be forced to cut expenses even more than it already has.

CEO Larry Barker says the solution is simple: Sell more Visual Uptime, the company's flagship gear that gathers frame relay, ATM and IP network performance data and interprets it so service providers and their customers can assure the services contracted for are being delivered. If he is successful, businesses can expect to see more service providers offering access to Visual Uptime data as a way to prove SLAs are being met. Recently, Barker spoke with Network World *Senior Editor Tim Greene.*

Who uses Visual gear?

The telecommunications marketplace segments out into three major categories by size: Companies that acquire [up] to 40 circuits; then a bunch of companies that fall into the 40-to-175-circuit delineation; and then 175 and above. Maybe 5% of the world's companies fall within that 175-and-above category. In the middle category, they may be 25% of the companies controlling 20% or 25% of the circuits. And in the lower category you have upwards of 70% of the world's companies, but they control maybe 5% to 10% of the total ports. [Up] to 40 probably doesn't have much staff to deal with management information even if they could get it. This may not be a No.1 priority for [Visual].

Where Visual plays is sort of between the two upper ones, that segment of the market that is sophisticated enough, has critical data, has some staff, but is looking to receive its performance-management information on circuits. They're going to get that from a service provider for the most part.

What can you do to attract more of these customers?

We're serving one market today via service providers. Then there's a set of customers that is a little smaller and a set of customers that is a lot larger that we want to serve.

[The smaller customers] would love to have Visual capability and the quality of our solutions extended out into more of the market, but the value against the cost model begins to get dissipated as you move into some of the less complex networks.

Because we tend to deliver via service, we're not as attractive to the more complex guys who have a lot of money and a lot of requirements. If we can think about ways to extend into those two market segments, all of a sudden we are serving a much larger portion of the market. [They] want our capabilities, but just may want to acquire it a little differently than how we're going to market today.

See Visual, page 27

Qwest and Sprint PCS strike wireless deal

■ BY DENISE PAPPALARDO

Qwest's wireless customers can look forward to national service plans that eliminate roaming fees and include new data services now that the carrier is teaming with Sprint PCS.

The companies announced a five-year agreement last week in which Qwest will transfer 1 million wireless customers to Sprint PCS' national network. The carriers did not discuss financial details.

Qwest is operating a regional wireless Code Division Multiple Access network in its 14-state region. But that network has been on the chopping block for more than a year, says Roger Entner, an analyst at The Yankee Group.

"They had one offer [before the deal with Sprint PCS], but it was less than stellar," Entner says. Now Qwest is looking to offload its network and wireless spectrum while holding onto its customers.

Qwest is working closely with Sprint PCS to develop a plan to migrate users to Sprint PCS' network, says Annette Jacobs, executive vice president of consumer markets at Qwest. Users will be offered Qwest-branded national calling plans that also will include Sprint PCS Vision wireless data options.

Qwest customers could buy these services directly from Sprint PCS, but the carrier plans to offer service bundles that will let users receive one bill for local land-line voice and wireless services, Jacobs says.

The carrier has not offered specific calling-plan details, but business users should expect plans that offer volume discounts for all Qwest services. Entner also says some users might prefer to deal with Qwest customer service. Typically, Sprint PCS is not ranked as one of the top wireless providers when it comes to customer service, he says.

And while Qwest hasn't offered pricing details, Entner also says Qwest's wireless service rates might be more economical for some customers. ■



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Short Takes

■ **Verizon Wireless** last week launched its first **wireless LAN service,** which lets customers connect to the Internet at up to 1.5M bit/sec. The service provider announced its plans to introduce a Wi-Fi service earlier this year. Verizon Wireless is teaming with **Wayport** to offer customers up to 650 Wi-Fi access points at hotels, convention centers and airports across the U.S. Customers can sign up for the carrier's **Daily Unlimited Access Plan** for $7 for each day of use. This lets them access any number of hot spots within a 24-hour period. The plan is designed for traveling customers who might only use the service while at an airport or hotel. Verizon Wireless users who are on the road often might prefer the **Monthly Unlimited Access Plan** for $35 per month.

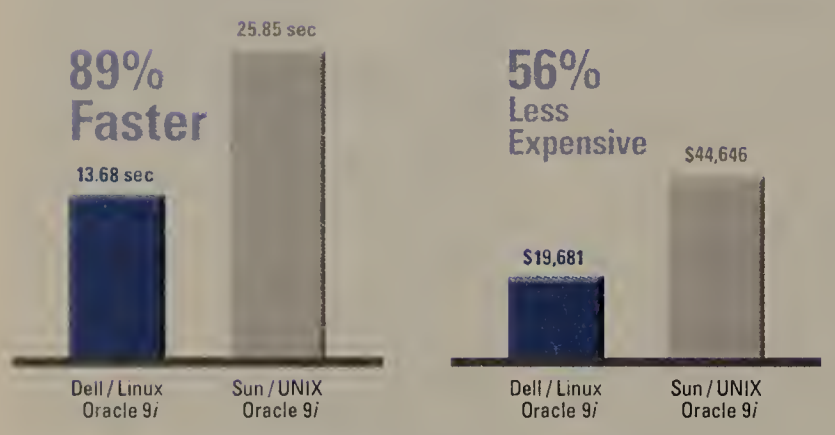
■ **Bell Canada** is offering a **managed Internet remote-access service** based on **Aventail's** Secure Sockets Layer remote-access gear. Called **Managed Remote Access SSL VPN,** the service enables companies to grant employees and business partners access to their corporate networks via Internet-connected PCs and requires no special software on the remote machines. The service is based on Aventail's EX-1500 appliance. It can supplement Bell Canada's Managed Remote Access IP VPN based on IP Security.

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EYE ON THE CARRIERS
Johna Till Johnson



Latest MCI 'scandal' isn't what it appears to be

Every time MCI appears to be sorting itself out, a new calamity hits. AT&T has filed an objection to MCI's pending emergence from bankruptcy that is based on charges that MCI has illegally routed calls to avoid paying millions of dollars in access fees. In response, the General Services Administration wants to bar MCI from federal contracts, which could cost the struggling carrier billions of dollars and perhaps its ultimate viability.

What's going on?

It's kind of like nailing Al Capone for tax evasion. Even if (as I believe) MCI is guilty, call-termination regulations are notoriously Byzantine, and exploiting loopholes is somewhat of a parlor game among telcos. Furthermore, while "millions of dollars" sounds like a lot of money, it's a few hours of operation for a large telco.

The underlying issue has more to do with an almost-universal resentment against the apparent disparity between MCI's behavior and the company's punishment. If "recklessly and dangerously mishandling a company" was a crime, MCI's former executives would be guilty.

That crime dwarfs the current round of fraud charges: Shareholders lost billions. The careers of thousands of MCI employees were injured or ruined, as were those of managers at other telcos — notably Sprint and AT&T — who reportedly lost bonuses and even jobs because of their inability to keep up with MCI's supposed "results."

Yet MCI appears to be getting away almost scot-free. With its debt reduced by bankruptcy and its infrastructure and customer base more or less intact, the company actually is better positioned competitively than are some rivals. So the current round of accusations and charges look almost like de facto justice: a way to punish MCI for the larger crimes that the courts can't or won't address.

As long as AT&T can prolong uncertainty facing its rival, MCI will continue to lose revenue . . .

However, AT&T executives aren't paid to implement justice (de facto or otherwise). They know that the access-charge issue is so minor as to be effectively a red herring. You can bet that deep in the heart of AT&T exists a business case showing that for every X dollars invested in the lawsuit, AT&T will reap Y dollars in return. For as long as AT&T can prolong the uncertainty facing its rival, MCI will continue to lose revenue — a certain percentage of which will go to AT&T.

Is this a good thing? It is if you're AT&T. It might not be if you're an IT executive whose viable telco options just shrank by one. And if AT&T succeeds in its apparent endgame, MCI might go away entirely. I don't see how network executives are served by reducing the competitiveness of the telco market.

I'm not defending MCI, and I'm emphatically not defending its former managers, particularly ex-CEO Bernie Ebbers and ex-CFO Scott Sullivan. (I'd like to see them both put away for years.) But using the current round of fraud charges as a justification to dissolve MCI is like taking a blowtorch to a mosquito — it'll probably work, but the collateral damage might be high.

Johnson is president and chief research officer at Nemertes Research, an independent technology research firm. She can be reached at johna@nemertes.com.

■ **Read more about reaction from the MCI scandal. PAGES 38 and 61.**

Q A

Visual

continued from page 25

What will you do differently?

I certainly think we need to look at how best to distribute our solutions based on how our customers want to buy. A good portion of our customers will continue to want to buy via the carriers, so we will continue to support the carriers in addressing that portion of the market that purchases managed services that way. We want to go after those markets that may want to acquire our solutions in alternate ways as well.

"We basically had the 'circuit-switched to packet to IP' performance-management story. Now we're going to take that very good story and apply it very specifically into targeted markets."

I'm having trouble imagining an alternate way.

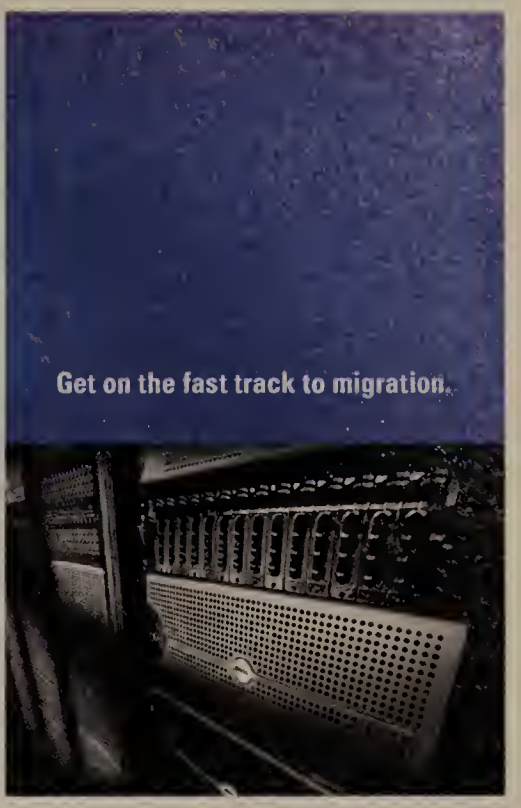
Through maybe a [value-added reseller]. Maybe you want to buy from us directly. Maybe they want to buy via some other network-related offering. A good example of that would be Cisco. [Visual monitoring software is an option on some Cisco platforms.] That would be one example of taking a portion of our value proposition, putting it onto a piece of hardware that gets deployed in the network and solves business problems that the traditional Visual way of going through the service providers weren't allowing us to get to. So if you think about what we did with Cisco and expand that out to other markets with other technologies and other capabilities, we're going to look for those types of ways to get to the market.

If I'm a business that might not be using Visual in any form, on what time scale might I expect something new to pop up to make me consider buying Visual products?

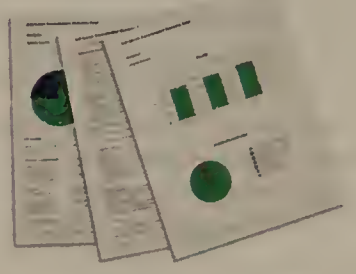
It will be within the short horizon, by the end of the year, let's say. We're going to begin to deliver our solutions more keenly focused around market segments as well, which is different for Visual. We basically had the 'circuit-switched to packet to IP' performance-management story. Now we're going to take that very good story and apply it very specifically into targeted markets.

Does that mean you'll customize a pitch for a specific market like government or financial services or creating customized versions of Visual products for these segments?

It could be both. I think the easiest and the thing you'll see out of the chutes first is taking the performance management value of Visual and applying it specifically to the individual needs of the businesses. But over time it wouldn't be out of the realm of possibility that we begin to develop very specific capabilities for an industry. ■



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Special Focus

SPEECH RECOGNITION: VXML, SALT aid development.

Voice-activated services gaining attention

■ BY STEPHEN LAWSON

AAA Auto Club South is on the Web ... but not all its members are there.

"More and more people continue to use our Web site, but there are a heck of a lot of people in our demographic who still want to do business by phone," says Mike Petrilli, senior vice president of information services. The auto club offers roadside assistance, insurance and travel services to 3.5 million members in Florida, Georgia and parts of Tennessee.

The club wanted to let members pay dues, check bills, change addresses and carry out other tasks more quickly over the phone, 24 hours a day. It also wanted to save money on call centers.

The answer was automated call center services using speech recognition technology. But rather than build the system itself, the club turned to a carrier.

As workers become more mobile and companies rely more often on good, fast, always-available support to hold customers, services based on speech recognition are starting to come to the rescue. Emerging industry standards are helping to open the market and pave the way for broader adoption, according to industry experts.

Speech recognition makes it practical to do things with a phone that would be too complicated using the 12-digit keypad. In some cases, callers won't have to work their way through a hierarchy of options by pressing numbers or saying words. Although it's not at the point where systems can understand anything a caller might say, callers no longer have to use specific words. Voice recognition also can trigger transactions without a live operator. Combined with speech-to-text and text-to-speech technology, it can support even more emerging applications. Several carriers have built these kinds of services and offer them to companies on site or at a central facility.

The auto club outsourced its system to WorldCom, now known as MCI. It kept the HTML applications it uses on the Web for selected services and let MCI create an interface between those applications and a speech recognition system.

Now when club members move they can enter a change of address without using the Web or talking to an operator. The "voice portal" prompts the caller for the postal code first, and then matches the street name and address the caller states against a database of possible addresses in that area. Having something to compare the caller's responses to aids in recognizing the spoken words, Petrilli says.

The club pays for MCI's services on a per-transaction basis. Petrilli compares MCI's piece of the system with a "black box" that he doesn't have to worry about.

"We chose to use an outsourced model ... primarily because we believe this technology is still pretty early in its life cycle," Petrilli says. "The software is changing very quickly. Why sign up to maintain that when it's really just a side job for us?"

Voice-activated services might count most on the road, where users might have just one data-access device available: a mobile phone. The payoff can be higher productivity. For example, service people in the field who have just finished a job can mark the ticket item as completed just by calling in to an automated system, says Marcello Typrin, director of product marketing at speech software vendor Nuance Communications.

Providing a speech-based interface to applications is a good thing for companies to outsource to a carrier, says Mark Plakias, an analyst at Zelos Group. In most cases, access to an application such as ERP by voice is only a small fraction of the use of the application, he says.

"There's no reason the enterprise should have to go out and buy a telephony platform to do this," Plakias says. Typrin, on the other hand, says companies can save on operating expenses by owning their own equipment, and more are doing so as they become confident in the technology.

Companies and carriers are using speech recognition because it's getting better, according to analysts. More powerful processors and refined algorithms are at the core of the improvement. Now, at the application development level, two new specifications that extend current mark-up languages are helping companies and service providers get started.

Voice XML (VXML) is an extension of XML that lets developers for corporations and service providers take advantage of work that already has been done to put applications and information on the Web. Released in Version 1.0 in 2000, it is now in Version 2.0. VXML has opened the voice-based market to new vendors, such as start-up VoiceGenie Technologies, while leading existing vendors to offer alternatives to their proprietary software platforms using VXML interpreter software.

Meanwhile, the Speech Application Language Tags (SALT) standard, backed by Cisco, Intel and Microsoft, also is coming on the scene. The platform is based on extensions of scripting languages, including HTML and XML. Microsoft released the first beta of its SALT-based Speech Server in July, but it is marketing the platform directly to corporations and not to service providers.

VXML already is helping developers get new voice-based services out more quickly and painlessly.

VoiceGenie's product is an example of how the specification can work. The company makes middleware that runs on Linux. That middleware is the interface between speech recognition systems that process what a caller says and VXML applications that answer or carry out tasks the caller requests, says Eric Jackson, vice president of strategy and business development at VoiceGenie.

Traditionally, interfaces between speech recognition systems and back-end applications have come in the form of proprietary software that speech recognition platform vendors have written for their own systems, according to Zelos Group's Plakias. The advent of VXML makes voice-enabled applications less dependent on the platforms on which they run. As soon as each platform maker provides a VXML interpreter to run VXML applications on its system, a single application can be adapted to all the platforms easily, experts say.

Emerging industry standards are helping to open the market and pave the way for broader adoption.

The specification made it easier and less expensive for BBN Technologies, a unit of Verizon, to develop voice-activated systems for Verizon call centers that also are being offered to other carriers and corporations.

"With Voice XML, the application you build is really yours, regardless of what systems you want to deploy," says Marie Meteer, director of call center solutions at BBN. Once an application for a voice-activated service has been written, it doesn't have to be rebuilt from scratch if BBN decides to change hardware and software platforms. That means companies and carriers can feel more confident about making an investment in speech recognition.

"These standards are growing and evolving over time, but the risks are relatively low, and at least you know them," Meteer says.

It also gives carriers a larger pool of qualified developers, Meteer says. With proprietary platforms, there has to be at least one developer with special training on that platform. By contrast, there are many HTML and XML developers who can make the leap fairly easily to working with VXML, she says.

SALT boasts similar advantages and possibly an even bigger developer base. It is a lighter set of extensions to current markup languages than VXML and easier for HTML and XML developers to use, Plakias says.

Analysts and industry participants are optimistic that VXML and SALT, both of which have been submitted to the World Wide Web Consortium, won't develop the type of rivalry between them that has stymied development in other areas. The two specifications are heading toward becoming one and might merge by the end of next year, according to Plakias.

Lawson is a correspondent with IDG New Service's San Francisco bureau.

What it's good for

Speech recognition, sometimes used with text-to-speech functions, opens up a range of new services.

- Automatic routing of support calls based on a request in the caller's own words.
- Voice-activated transactions such as purchases using a credit card number.
- Caller authentication through comparing the voice to a "voiceprint."
- Outbound messages delivered to many recipients in the most appropriate form for the device they are using.
- Multimodal applications that let users speak and listen, or read and write, different kinds of information on one device.
- Voice-activated dialing.
- Hands-free access by phone to e-mail and a personal address book.
- Audio Short Message Service.

Technology Update

■ AN INSIDE LOOK AT THE TECHNOLOGIES AND STANDARDS SHAPING YOUR NETWORK

IPFIX fine-tunes traffic analysis

■ BY PAUL KOHLER AND BENOIT CLAISE

Soon it will be easier for IT managers to extract and view important traffic statistics stored in their routers so they can better manage their networks.

The Internet Engineering Task Force (IETF) is standardizing the format used for exporting router-based information about network traffic flows to data collection devices and network management systems. The proposed standard, IP Flow Information Export (IPFIX), will work across any vendor's routers and management applications that support the protocol.

In other words, IT departments will no longer have to match routers supporting proprietary export formats with applications that have been developed specifically to support those formats. The export format also is extensible, so network managers won't have to upgrade their router software or management tools as their traffic-monitoring requirements change.

Exporting network traffic information from a router and viewing the statistics on a per-flow basis gives network managers information they can use to make key decisions. Administrators who know how many packets and bytes are sent to and from certain IP addresses or across specific network interfaces can create usage-based departmental charge-back systems. They also can use the information to traffic-engineer their networks for optimum performance.

The IETF chose Cisco NetFlow Version 9 data-export format as the basis for IPFIX. IPFIX defines the format by which IP flow information can be transferred from an exporter (router or switch) to a collector. Applications that support IPFIX will understand and display statistics received from any router that also supports the standard.

Network managers will be free to add or change the fields (the specific parameters and protocols) against which they want to monitor their IP traffic flows. This is possible because IPFIX is a template-based format for data export, which makes it extensible. The use of templates means network administrators and vendors don't have to alter their software to support a new format every time a company wants to view traffic statistics based on different criteria. Changes that corporations might desire include adding network accounting of IPv6 and/or IP Multicast packets to existing IPv4 packet monitoring.

To export data, routers represent each network traffic flow based on seven key fields:

- Source IP address.
- Destination IP address.
- Source port.
- Destination port.
- Layer 3 protocol type.
- Type-of-service byte.
- Input logical interface.

If all seven key fields in two different packets match, both packets are designated as belonging to the same flow. Packets in that flow are compared against the same match criteria and counted. Today there also are additional non-key fields that can be tracked for network accounting purposes in many systems, such as the source IP mask, destination IP mask, source autonomous system, destination autonomous system, TCP flags, destination interface and IP next-hop.

If network operators want to account for packets based on additional fields, the template-based format inserts a new field following the export packet header in which new template records can be added. Each template has a unique ID number that will match a traffic-flow ID number to associate a given template to the appropriate data record. The template flow-set establishes the field types and lengths, while the ID number ties the fields to the specific data-flow export.

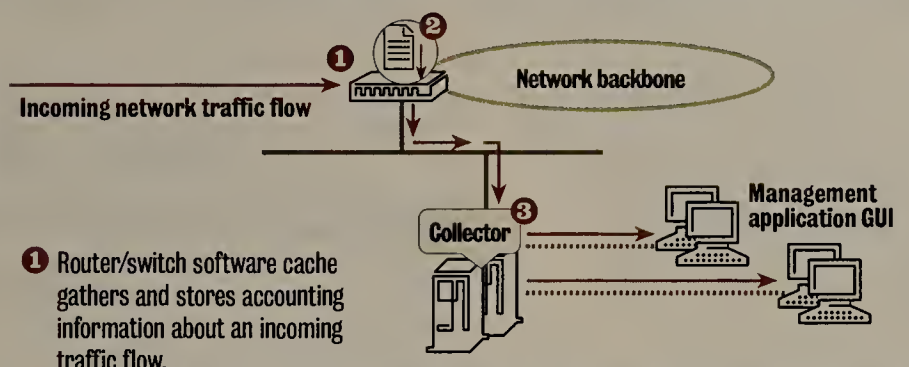
The IPFIX-compliant router/switch sends template definitions to the IPFIX-compliant collector specifying what flow records it can expect and in what order. The flow records then can be decoded and stored locally on the devices.

The IETF is expected to submit the IPFIX drafts for publication as a proposed standard late this year or in early 2004. Using a template-based, flexible file-format approach, routers will have a common way to communicate to collection devices and applications, letting network administrators quickly amend network analysis without having to make major software changes to their systems.

Kohler is a technical marketing engineer in the Internet Technologies Division at Cisco. He can be reached at pkohler@cisco.com. Claise is technical leader at Cisco and can be reached at bclaise@cisco.com.

■ HOW IT WORKS IPFIX

IPFIX uses a standard format that routers can use for exporting network traffic information to collection devices and network management systems.



1. Router/switch software cache gathers and stores accounting information about an incoming traffic flow.
2. When the traffic flow expires, the router/switch tells the collector the specific set of fields, lengths of fields and other information it can expect to receive about the traffic flow. Then the router/switch sends the data to the collector in that format.
3. The collector receives and aggregates network statistics, and then forwards them to any compliant vendor's application for display.

Ask Dr. Internet

By Steve Blass

I have a VPN problem: My network connection fails to renew the dynamic IP address once the VPN is connected. The VPN uses a PPP adapter over a broadband cable connection. The cable provider uses Dynamic Host Configuration Protocol to lease and renew IP addresses. I had no problems releasing the IP address when connected to the VPN. When I moved to a new job, the VPN connection between the home PC and work PC was different from the previous company's. The old VPN client logged on to a Windows domain; the new one doesn't.

To fix the problem with the Microsoft VPN on Windows 2000 Professional, adjust the VPN TCP/IP settings as follows: First, disable passing the local host's Internet access through the remote gateway so you can get to the Internet without going through the corporate network. Second, remove the DNS suffix of the local host for the VPN TCP/IP so your computer can resolve Internet names more efficiently. These adjustments let the local host renew the IP by directly contacting the ISP's DHCP server over the Ethernet adapter, instead of tunneling this action through the PPP adapter.

Blass is a network architect at Change@Work in Houston. He can be reached at dr.internet@changeatwork.com.

GEARHEAD INSIDE THE NETWORK MACHINE



Mark Gibbs

Final Samba steps

Last week we dug into the Samba system and suggested that you download a copy so we could set it up. Given the number of possible server operating systems that Samba is available on, we're going to overview this procedure over Linux.

Depending on which Linux distribution you use, you can choose to install: a binary version you compile from source, which is likely to be mandatory if you have compiled a custom Linux kernel; a pre-compiled binary version, which is usually at a lower release level than you would get from compiling from the latest source; or as a "package" — in the case of Red Hat Linux, this is the "rpm" version.

For those of you not familiar with RPM the acronym is for Red Hat Package Manager, a powerful software management system that installs, removes, upgrades, verifies and builds RPM archives. These archives are files of the type .rpm that include source and or binaries, package identification data, component checksums and scripts for carrying out various operations.

There are all sorts of variants of package managers available for different Linux distributions such as the ancient Slackware Linux installpkg through to Debian's apt and Red Hat's rpm. The Samba site has downloadable packages for most of the mainstream package managers, which you'll find in the appropriate operating system subdirectory.

Down to business

As much as we'd like to discuss the intricacies of compiling Samba and running package managers, space prohibits, so we'll suggest that you check the documentation for your operating system and the version of Samba you downloaded.

Once you have installed Samba it needs to be configured. Under Red Hat Linux 9 the configuration file is named smb.conf and is created by the rpm processes in /etc/samba.

Here's a simple configuration file:

```
[global]
workgroup = GEARHEAD
encrypt passwords = no
[myshare]
comment = My documents
path = /home/mgibbs/documents
read only = no
guest ok = yes
```

Red Hat Package Manager is a powerful software management system that installs, removes, upgrades, verifies and builds RPM archives.

The global section above declares that we're defining a workgroup named GEARHEAD and that we don't want to use encrypted passwords (the next version of Samba, Version 3, won't need this command because passwords will be encrypted by default). The myshare section defines a share of the same name that has both read and write privileges and has guest access enabled (a horribly unsecure combination).

Now, while you can set up Samba's configuration file by hand, you might prefer to use GUI-based applications such as the Samba Web Administration Tool (SWAT), or if you are running Red Hat Linux 9, the Samba Configuration tool called redhat-config-samba. But while these tools are good — SWAT is by far the most sophisticated— if you need complex custom parameters, there's no alternative but to get down and dirty with a text editor.

And when you make changes to a Samba configuration — particularly when you've edited it by hand — you will have the problem of trying to figure out if the configuration will work. Before you do anything else you should run the program testparm, which scans the configuration file for syntactic errors and dumps all defined and defaulted parameter values to the console.

Armed with this information and with the assistance of the Samba help files, you should be able to get a working SMB service up and running. We also would highly recommend that you get a copy of *Using Samba* by Ts, Eckstein and Collier-Brown (O'Reilly, 2003) — an invaluable and thorough reference to the Samba system.

Next week will be something completely different. In the meantime share your data with gearhead@gibbs.com.



CoolTools

Quick takes on high-tech toys

By Keith Shaw

Secure that IM client!

Security company Zone Labs this week is expected to announce a new instant-messaging security product that lets end users secure their instant-messaging client, regardless of the client or service used.

Zone Labs' IMsecure Pro is security software that works with AOL Instant Messenger, MSN Messenger and Yahoo! Messenger. The software helps secure and make conversations private, and protect PCs from potential harm from hackers, identity thieves, spammers and other predators who might take advantage of instant-messaging vulnerabilities. The company says the product requires no changes to end users' habits and works in the background. IMsecure Pro secures by protocol, meaning it still will work if clients are updated, Zone Labs says.



The "instant protection" setting of Zone Labs' IMsecure Pro includes a security log that records events.

Version 1.0 supports protection for the three major instant-messaging services listed above, but also third-party clients such as EasyMessage, Imici, Meca and Trillian. Other features include an "instant protection" setting, which includes a security log that records security events; inbound threat protection, such as protecting instant messages from hackers using malicious codes or buffer overflow attacks; and outbound threat protection, through an ID Lock that prevents users from mistakenly sending personal information such as a Social Security Number, bank account or credit card numbers. This feature also can be used to prevent children from giving out their street addresses or school addresses via instant messages to strangers.

Additionally, a message-encryption feature is included that can encrypt traffic between any two IMsecure Pro clients (using 56-bit encryption). Other settings let users block file transfers, voice and video, and save bandwidth.

The Pro version costs $20 with a year of free updates, and is available now at the Zone Labs Web site. A 15-day trial version is also available. For basic security, a free version (IMsecure) offers simple instant-messaging protection from buffer-overflow attacks and the ability to encrypt one ID at one instant-messaging service. Designed for personal and non-profit users, the free version will be available at the end of this month.



The Samsung SPH-i500 combines a Palm PDA with a mobile phone.

Sprint/Samsung launch i500 Palm-based smart phone

Sprint last week announced availability of the Samsung SPH-i500, the latest Palm OS-based smart phone (converged device) that combines a Palm PDA with a mobile phone. The i500 is available for $600 through the Sprint PCS Web site and other retailers.

The phone includes a 66-MHz processor, 16M bytes of memory and a color screen (65,000 plus colors) in a clamshell design. The phone can connect to Sprint PCS' Code Division Multiple Access 1xRTT network, which provides data rates on average between 50K and 70K bit/sec, Sprint says. The i500 includes the Blazer Web browser for viewing HTML-based Web sites on the device.

Other features include one-handed and voice-activated dialing, and customized button assignments that let users pick which applications or functions to launch. The i500 comes with a slim lithium ion battery that provides up to 2.8 hours of talk time and up to nine days of digital standby. Users also can choose a standard battery, which offers up to 4.2 hours of talk time and up to 15 days of digital standby time.

Shaw can be reached at kshaw@nww.com.

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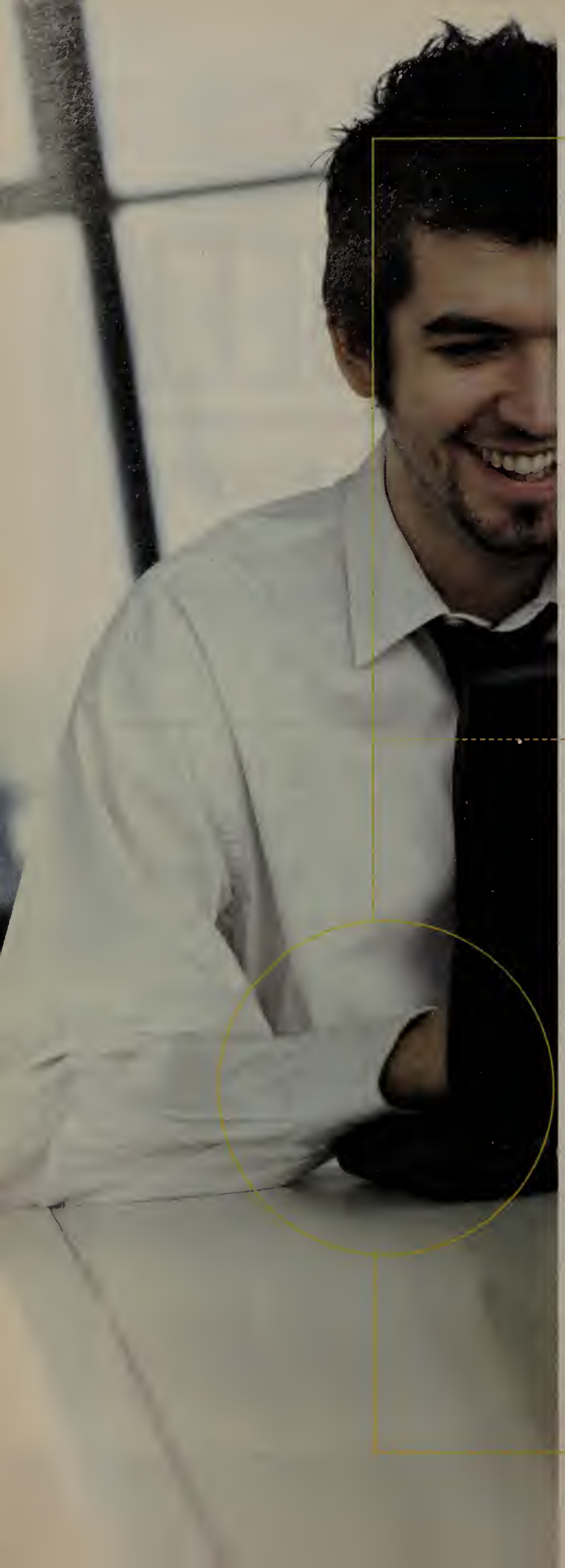
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NETWORKS™

An Executive Summary
Produced by IDC

IDC Perception Survey On Wireless Professional Services

Summary Report



In our personal lives and within the traditional workplace, the boundaries of time and place are being eliminated by all forms of mobile computing and communications capabilities. These transformational solutions and technologies underscore the notion that work and play are no longer necessarily physical places; rather, they are activities that can be performed virtually anywhere at virtually any time. This concept of mobility suggests the computing and communications landscape of the next five years will continue to evolve to a point at which wireless infrastructure and mobile applications will enable more than just untethered voice and data access and communications capability.

In a very tangible sense, the deployment of a more robust and secure wireless infrastructure as well as the development of more innovative and functional mobile application solutions will allow forward-thinking firms to experience the benefits of a fundamental business process transformation (BPT). A transformation that will reshape the way in which organizations engage employees, customers, supply chain partners, and other relevant stakeholders.

Written by Richard Dean, program director for Infrastructure Integration and Support Services team at IDC

Building a Foundation for Mobile Solutions

The foundation for developing an enterprise-wide mobile solution begins with an understanding of how the integration of wireless technologies and mobile applications can create efficiencies around traditional business processes. This journey not only uncovers the benefits of mobility, it also acknowledges the inherent challenges (e.g., perceived security risks, etc.) associated with voice and data communications transmitted over wireless networks. From this understanding, organizations can then consider the necessary steps that are required in developing a comprehensive business case that justifies the decision to pursue or postpone such a plan.

In planning for the implementation of a wireless solution, organizations typically consider many variables – from the expected return on investment, to identifying the specific business processes to be transformed, to educating various user groups about this new or expanded technology-based solution. One consideration just as critical in determining success or failure is for these organizations to determine at a very early stage if it will use internal IT resources or select an outside services firm to design, build, or manage some portion of the project. External professional services firms often play a key role in helping their clients connect the business case to the tangible benefits of mobility by offering high-value consulting, integration, and managed services. These service activities are often referred to as the professional services offered by third parties (e.g., consulting firms, software vendors, the services divisions of hardware manufacturers, and value-added resellers) to help a client isolate and define a business problem (e.g., supply chain management) and then design, implement, and manage a customized solution through the utilization of wireless technologies and the integration of customized vertical applications.

IDC's Report Offers In-Depth Analysis

An upcoming research report (Marketplace Perceptions of Wireless Services Firms) from IDC, produced in collaboration with NetworkWorld, indicates the end-user community has wide-ranging opinions about the value of such services and the vendors that purport to offer the "right" solution for that organization. In one of the most extensive studies ever conducted of the wireless professional services markets, IDC surveyed in May 2003 a total of 459 individuals (representing more than 15 vertical industries) for opinions and perceptions of the wireless professional services industry and the vendors competing in the marketplace.

The survey instrument was created to elicit detailed responses from key influencers and decision makers regarding their cognitive association and experiences with (1) the wireless solution implementation skills of external providers, and (2) the decision maker's rationale for considering but ultimately deciding against the implementation of a wireless solution. Leveraging this direct feedback from these respondents that were chosen for the IDC Web-based survey, this report, Marketplace Perceptions of Wireless Services Firms, describes in detail the perceptions and opinions of influencers and decision-makers regarding several compelling issues, including:

- Budget and funding variances for wireless and mobile projects
- Into which spending allocation categories (i.e., devices, hardware, software, external services) budgeted funds are likely to be directed
- A value assessment of selected services attributes (i.e. technical expertise, knowledge of core business model, etc.)
- Marketplace awareness of selected vendors that offer wireless and mobile consulting, implementation, and managed solutions to enterprises and mobile service providers
- Perceived performance of selected vendors that offer wireless and mobile consulting, implementation, and managed solutions to enterprises and mobile service providers

Comparative Results

Not surprisingly, while the results indicate many services firms are viewed as extremely competent and offer exceptionally high levels of business and technological expertise, other survey respondents indicate a general lack of knowledge and even some skepticism about the need for such services. For instance, many self-sufficient small and medium-sized organizations (for the purposes of segmenting the respondent base, those with fewer than 999 employees) with basic network connectivity requirements and more modest budgets prefer to implement such solutions using internal resources. One key reason is that budgets allocated for wireless solutions from the small to medium-sized respondent base tend to be quite limited. For instance, approximately 87% of this segment indicated their 2002 budget for wireless or mobile infrastructure hardware and application solutions totaled less than $100,000. In comparison, just over 60% of very large organizations (those with more than 10,000 employees) reported their 2002 budget for wireless or mobile infrastructure hardware and application solutions exceeded $100,000. See Figures 1 and 2 below.

FIGURE 1

Small and Medium Sized Organization's 2002 Budgets for Wireless Solutions

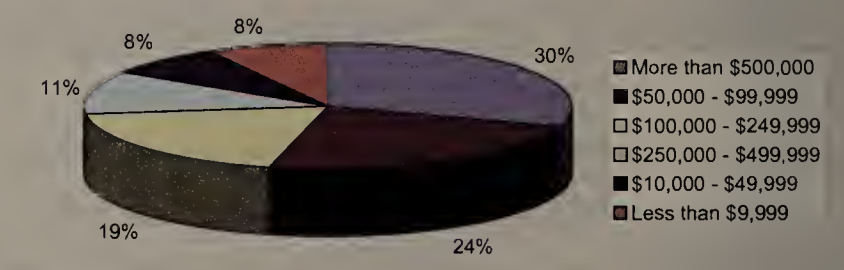
In 2002, what was your organization's total annual budget for wireless or mobile infrastructure hardware and application solutions?



FIGURE 2

Very Large Organization's 2002 Budgets for Wireless Solutions

In 2002, what was your organization's total annual budget for wireless or mobile infrastructure and application solutions?



Source: IDC, 2003

Preference for using internal IT resources or selecting an outside services firm to design, build, or manage some portion of the project also varies by the size of the client organization. As seen in Figure 3, only 20% of all respondents from the small and medium-sized respondent segment have used an external services firm in implementing any part of a wireless solution. For very large organizations, the percentage of client organizations that have used external services vendors increases to 41%. See Figure 4.

FIGURE 3

Percentage of Small and Medium-Sized Organizations That Have Utilized External Services Firms to Implement a Wireless Solution

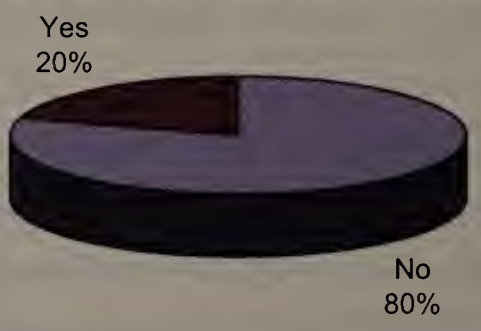


FIGURE 4

Percentage of Very Large Organizations That Have Utilized External Services Firms to Implement a Wireless Solution



Source: IDC, 2003

Budgets and Perceptions from the Health Care Sector

One of the most important elements of IDC's extensive report is its reporting and analysis of how services vendors are viewed through the eyes of existing and potential customers. Although responses were collected from 15 different industry segments, this section will focus on selected questions and answers from one vertical industry that continues to adopt wireless solutions at an impressive rate: the heath care sector. The figures below offer an illustration of how this sector is investing in wireless solutions and why marketplace perceptions can shape future business opportunities for external services firms.

FIGURE 5

Reasons for Deploying a Wireless Solution in Health Care Industry (N=18)

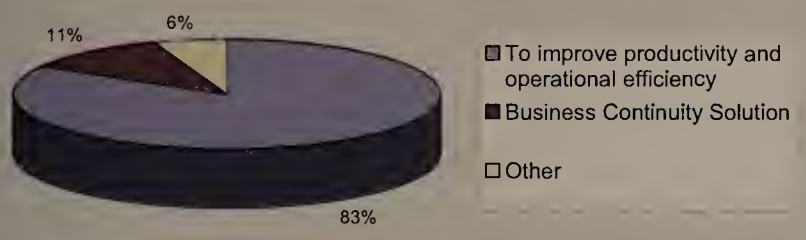


FIGURE 6

2003 Budget for Wireless Solutions in Health Care Industry

For fiscal year 2003, have your planned expenditures for wireless and mobile solutions been reduced or delayed due to the general economic slowdown?

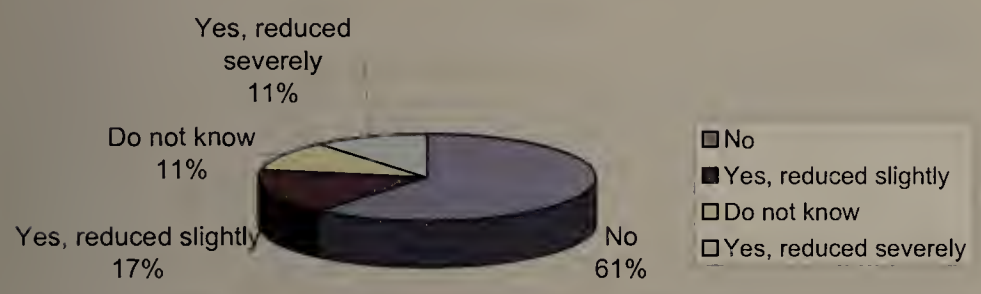
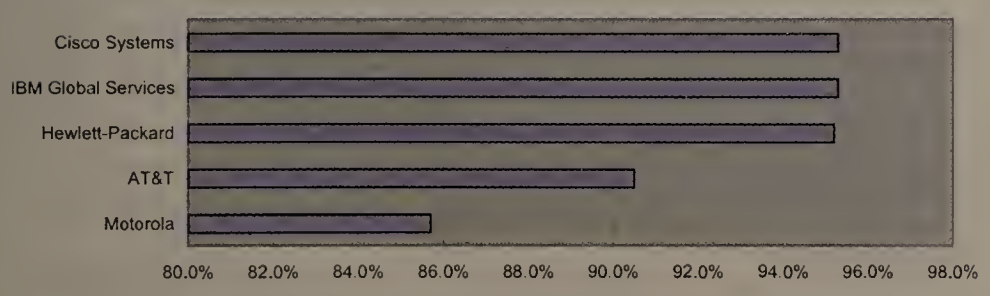


FIGURE 7

Top 5 Wireless Services Vendors Based on Marketplace Awareness in the Health Care Industry



Source: IDC, 2003

Mobility in Health Care: A Case Study

One of the wireless market segments showing signs of growth is the wireless local area network (WLAN) deployment space as enterprises of all sizes continue to invest to improve internal operating efficiencies and gain a competitive advantage. During the first half of 2003, the enterprise sector (particularly retail, manufacturing, education, and the health care markets) consistently engaged the services of firms capable of providing specialized expertise in designing and integrating WLANs. In fact, health care implementations of WLAN solutions continue to display great promise through 2006, as many of these organizations look to contain costs, enhance productivity, and improve security in response to the sweeping changes brought on by the Health Insurance Portability and Accountability Act of 1996 (HIPAA).

Recently, telecommunications provider BellSouth formally announced it implemented a large-scale WLAN project for Birmingham, Alabama-based St. Vincent's Hospital. St. Vincent's, a 338-bed acute care hospital serving a five-county area, is a member of Ascension Health, the nation's largest not-for-profit health system. St. Vincent's is designated as Ascension Health's flagship digital hospital and has been recognized nationally for its technology initiatives.

The 21st Century Healthcare Provider. For the past decade, St. Vincent's Hospital has been recognized as one of the leaders in developing and deploying technology aimed at enhancing patient care. St. Vincent's innovative application of technology that helps accelerate efficiencies in the healthcare system is highlighted below:

- Pharmaceutical and patient bar-code scanning at bedside to prevent medication errors
- Computerized physician order entry (CPOE) to provide staff physicians with the best in evidence-based medicine — including "best practices" protocols — at the moment of medical decision-making.
- St. Vincent's patients today can pre-register at home using the hospital's community portal, accelerating the admission process.
- Staff physicians can electronically "sign" their orders at physician PC stations on every floor of St. Vincent's 648,385 square-foot hospital campus.
- Wireless bedside registration in the emergency department enables family members to remain at the patient's bedside to answer admission questions.

BellSouth as a Strategic Partner

BellSouth has been successful in establishing a relationship with St. Vincent's not solely as a telecommunications provider or reseller of networking hardware. Rather, BellSouth has become a strategic partner to St. Vincent's over the past decade as the hospital continuously embraced the advantages of technology deployment. In working with St. Vincent's on the WLAN engagement, BellSouth at an early stage began working with key hospital administrators to win Board approval for funding this nearly $1 million project.

After gaining Board approval, BellSouth then began designing network specifications based on a detailed site survey. Individual project management elements of BellSouth's engagement are found below.

Radio Site Survey Process and Overview. BellSouth's radio site survey is a process by which test data is collected, analyzed, and interpreted by technicians to determine hardware requirements needed to achieve reliable RF propagation. This enables use of the selected mobile devices in the areas required.

Data is collected by establishing two-way radio communications via a stationary and mobile unit at various points within a facility at 2.4GHz, utilizing the Direct Sequence and Frequency Hopping method. The two units consist of a Cisco PC Card radio and a Cisco Aironet Access Point with an external antenna.

Testing is performed with a free running program that constantly transmits, checks, and echoes data packets between the two units. Results are continuously displayed to provide instantaneous feedback. The mobile unit is moved throughout the coverage area, and results are analyzed to determine the placement and quantity of equipment required for reliable RF propagation coverage.

Installation Considerations. In deploying WLAN solutions, BellSouth typically does not accept responsibility for the integrity of the underlying wired network to which the access points are attached or the impact of additional WLAN expansion.

Electrical Installation Guidelines. Cisco Aironet equipment (BellSouth's choice for this engagement) is designed to work on the generally available in-building power supply. However, like all electronic equipment, its performance is subject to degradation due to some commonly inherent or random electrical problems or disturbances.

Apart from building configuration, interior usage, and electrical considerations, there are other elements that might impact the performance of a system that should be considered before choosing the type of equipment. These include:

- Ambient temperature ranges
- Dust, dirt, humidity, and weather elements
- Planned usage (e.g., light commercial versus industrial)
- Location susceptibility to lightning and/or power fluctuations

Warranty of Coverage. BellSouth's site survey results as reported to St. Vincent's were guaranteed for 30 days from the site survey date to meet or exceed specifications in the areas illustrated in the vendor's final report, if the equipment enumerated is installed, configured, and tested per the final report.

Any changes to the facility's structure or parameters within the building may create the need for an additional survey of the site for an additional fee. Environmental changes can affect system requirements, creating additional costs in labor and materials for this client. Also, any obstruction of an access point or antenna by furniture will also void the warranty of coverage.

BellSouth Security Disclaimer. Due to the nature of wireless communications, BellSouth explains to clients that radio signals can spread beyond the installation's perimeter. This creates a possibility of eavesdropping on and interfering with communications. The Cisco Aironet 350 series supports 40-bit and 128-bit encryption for wireless communications, and every effort is made by Cisco to ensure the privacy of such communications. However, BellSouth and Cisco cannot be held responsible for any security breaches created by installing and running a wireless network.

Radio Site Survey Results. Based on the results of BellSouth's site survey, it is determined mobile coverage needed at St. Vincent's can be achieved through installation of a Cisco Aironet radio system. Units are procured, and the installation process begins based on:

- Type and amount of hardware required
- A system configuration plan
- A detailed architectural drawing and coverage area needed

St. Vincent's Expected Return on Investment (ROI)

Currently, BellSouth and St. Vincent's are in the implementation phase of the engagement. At the conclusion of the WLAN project, St. Vincent's hopes to be able to provide wireless connectivity throughout its four main campus buildings and provide patient care personnel with access to a wide range of patient medical record information via the use of secure handheld devices (Hewlett-Packard's iPAQ pocket PC). In addition, the hospital also expects to benefit from an improved revenue cycle through faster reimbursements from health insurance providers. And, finally, St. Vincent's, with a growing reputation as a technology leader, expects to be in a position to recruit patient care personnel more effectively in light of a nationwide shortage of skilled health care practitioners.

Size of the Market Opportunity

In terms of the opportunity for firms wishing to gain share in this market, IDC sees a substantial and sustainable future. When IDC examines and sizes the total addressable wireless infrastructure and applications services market, the magnitude of the global opportunity becomes clear. In total, IDC sees spending for all services activities (with the exception of hardware and software maintenance and support) reaching $34.5 billion in 2003 and nearly doubling to $68.3 billion by the end of 2007.

The factors influencing such demand for various wireless and mobile consulting, integration, and managed service segments in the United States are described in detail in the following sections. These factors are dynamic and often consist of the federal and state regulatory issues, macroeconomic concerns, and technological developments, which, when considered in totality, help shape market growth (or decline) within the industry as a whole and within certain spending segments (i.e., infrastructure and applications).

Regulatory Factors

Among the regulatory and legislative actions with the potential to influence spending in the wireless marketplace are, separately, the Broadband Jumpstart Act and E911 mandates.

The Broadband Jumpstart Act

First drafted in late 2002 and introduced in January 2003, the Broadband Jumpstart Act (also known as the Boxer-Allen Bill after the bill's sponsors, Senators George Allen [R.–VA] and Barbara Boxer [D.–CA]) is designed to accelerate the proliferation of hotspots using the 5Ghz spectrum and eliminate signal congestion and interference. The goal of the Jumpstart Broadband Act is to cultivate an environment that embraces innovation and encourages the adoption of next-generation wireless broadband Internet devices. The bill's sponsors also hope the legislation builds confidence among consumers, investors, and innovators in the telecommunications and technology industries to continue the expansion of broadband deployments nationwide. IDC believes the Boxer-Allen Bill, while largely symbolic, represents a cornerstone legislative initiative beneficial to the users and to developers of Wi-Fi technology and infrastructure and application services.

Enhanced 911

In a series of orders since 1996, the Federal Communications Commission (FCC) has taken action to improve the quality and reliability of 911 emergency services for wireless phone users by adopting rules to govern the availability of basic services and the implementation of E911 for wireless services. In August 2000, the FCC adopted an order to implement the Wireless Communications and Public Safety Act of 1999 (911 Act).

The FCC's wireless 911 rules seek to improve the reliability of wireless 911 services and to provide emergency services personnel with location information that will enable them to locate and assist wireless 911 callers more effectively. To further these goals, the agency has required wireless carriers to implement E911 service in two phases, subject to certain conditions and schedules. Phase I requires carriers, on appropriate request by a local Public Safety Answering Point (PSAP), to report the location of a wireless 911 caller and the location of the antenna that received the call. Phase II requires wireless carriers to provide far more precise location information, identifying callers to within 50–100 meters in most cases.

The deployment of E911 requires the development of new technologies and upgrades to local 911 PSAPs, as well as coordination among public safety agencies, wireless carriers, technology vendors, equipment manufacturers, and local wireline carriers. The FCC established a four-year rollout schedule for Phase II, which began October 1, 2001, and should be completed by December 31, 2005. IDC expects the wireless industry to spend on related integration services through 2005 to meet this deadline.

Macroeconomic

In 2002, corporate scandals, plunging stock markets, and record-setting bankruptcies all contributed to instability in the IT services marketplace. Although many economic factors are impacting the wireless services marketplace today, perhaps none has placed as much stress on vendor profit margins as price deflation. Fierce competition within the industry has actually forced down prices for some professional services activities. For example, in planning the design of a wireless LAN, a radio frequency (RF) technician trained in network design measures analyzes the site to determine the locations and quantities of equipment required to ensure 100% radio coverage. IDC closely monitors wireless professional services price points, and recent research indicates the fees associated with site survey consulting activities have declined during the past 24 months by approximately 10%. Although pricing constraints for wireless professional services will continue to some degree in 2003, IDC sees these pressures abating during the year as demand conditions stabilize and then gradually improve.

ABOUT THE AUTHOR



Richard Dean is a program director for IDC's Infrastructure Integration and Support Services team, a group of research programs that include Wireless Infrastructure and Application Services (WIAS). Additionally, Mr. Dean is involved with the research initiatives for IDC's Network Lifecycle Services (NLS), Information Security Services (ISS), and Software and Systems Support Services (SSSS) programs.

In this position, Mr. Dean manages the market analysis, commentary, and client support for all of the research areas through a team of dedicated research professionals. Mr. Dean also participates in IDC's ongoing international research forum to explore and define the firm's next generation services-focused research architecture.

Prior to joining IDC, Mr. Dean served as an analyst with IDG's Corporate Services Group. Previously, Mr. Dean worked in analytical positions with Hewlett-Packard Company and NEC. He has authored numerous freelance articles in a variety of publications and been a featured analyst in several trade magazines. In addition, Mr. Dean has been quoted frequently in various media including, The Wall Street Journal, Investors' Business Daily, Business Week and he has appeared as a guest analyst on several syndicated business programs.

Mr. Dean earned a Master of Arts degree in Business Administration from Framingham State College and a Bachelor of Arts degree in Business Management from Worcester State College.

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EDITORIAL

John Dix

MCI: The second 100 days

The completion of Michael Capellas' second 100 days as head of MCI was marked by the arrival of a fraud accusation from AT&T and news that the feds might bar MCI from seeking government agency business.

That's a far cry from the carefully orchestrated rah-rah fest thrown on the company lawn and Webcast to the world in April to recount the accomplishments of Capellas' first 100 days, which were indeed action packed — new management sworn in, strategic plan completed, company rebranded and reorganization plan approved.

The latest round of bad news started with the accusation by AT&T, SBC and Verizon that MCI fraudulently routed calls through Canada to avoid paying access fees to other carriers. MCI countered that all carriers practice least-cost routing and the claims against it "have been made solely for competitive gain."

Some observers agree. Investment research firm Precursor Group characterized the allegation as a "transparent industry assassination attempt" meant to derail MCI's emergence from bankruptcy. It won't work, Precursor argues. The dollar amount is too low and the regulatory area in question too complex for this to cause trouble.

But while that mess was still unfolding, MCI was hit with news that the government is considering prohibiting it from bidding on new federal contracts. MCI has vowed to fight for the right to be considered for future work.

How does all of this news sit with large would-be customers? I asked two multi-billion dollar outfits if the blemishes would influence their decisions, and here's what they had to say:

"I would consider them. There needs to be competition in the market, and MCI was a positive market force in the past, only running into trouble in the last five years or so. They will emerge from Chapter 11 in decent shape."

But the other wasn't so kind: "We included them in a RFP with a lot of mixed feelings about the Chapter 11 process. We thought they would be aggressive on pricing and we could at least use them to balance cost. But they've been one of the most expensive so we eliminated them. The all-smiling sales crew has not lost a bit of its arrogance. I'm amazed at how few have changed their attitude."

Capellas has achieved a lot in a short time, but the latest news and customer views like the latter show just how much further he has to go.

Nonetheless, observers say MCI will likely emerge from bankruptcy on schedule (the next milestone is a confirmation hearing Sept. 8), even in the face of these latest developments.

— John Dix
Editor in chief
jdix@nww.com

opinions!

WLAN rules needed

Regarding Mark Gibbs' Gearhead column "Wrapping up the WLAN" (www.nwfusion.com, DocFinder: 7123): One thing missing from almost every wireless LAN article I see is some general rules for setting up a WLAN. Some of the problems that usually aren't covered but should be include how to place the access points so you have the correct coverage area, how to beat channel problems, and the problems of two different frequencies.

J. Larry Dishman
Albuquerque, N.M.

In defense of indents

In Mark Gibbs' Gearhead column "Potpourri for geeks" (DocFinder: 7124), he quotes reader John Gay as saying, "Structuring code for readability makes sense, but embedding intelligence in indents takes us back to the 80-column punch card days, when spaces mattered a lot." It's easy to miss a semicolon when reading through screens of code trying to find a problem. It's much easier to see that a loop, if-then or case structure is not indented properly.

I started my career maintaining two COBOL systems that had more than 100 discrete programs between them, and each program typically called up to 20 "include" sections. These systems had been written and/or maintained by several people in the past, with varying levels of "clean code" discipline. Before that, I was a lab assistant in my college computer lab. Using indentation to control programming structure is the best idea I've heard related to programming languages in almost 20 years.

Scott Hutchinson
Network support team
Sheriff's Information Systems
Contra Costa County, Calif.

E-mail letters to jdix@nww.com or send them to John Dix, editor in chief, Network World, 118 Turnpike Road, Southborough, MA 01772. Please include phone number and address for verification.

Hot spots not so hot

Regarding "Starbucks gets win-win from Wi-Fi" (DocFinder: 7125): I'm skeptical that T-Mobile or anyone else is making real money with hot spots. It seems useful for Starbucks internal use and as a marketing gimmick for the public. Recently I went to a hot-spot-enabled Starbucks and was able to gain access to several other wireless access points, for free, without leaving the store.

Charles Stern
New York

Extensible protocols

In the review "XRN Interconnect architecture" (DocFinder: 7127), I disagree with the assessment of Spanning Tree Protocol (STP) and Layer 3 redundancy with Virtual Router Redundancy Protocol (VRRP) and other proprietary variations as only being able to provide one active router or switch.

STP can be used to load balance virtual LANs. So, in a redundant environment, a switch can have multiple uplinks in the forwarding state. With Cisco's variation on VRRP, Hot Standby Router Protocol (HSRP), all routers are in an active state and capable of forwarding packets, although users will only be able to use one default gateway. But in a redundant environment, the primary default gateway for each VLAN can alternate between the routers, giving a pseudo-load-balanced environment and definitely an active-active environment.

Mark McConnell
Senior network engineer
Coleman Technologies
Orlando

Review author David Newman replies: As protocols, neither STP nor VRRP provide for active-active configurations. The fact that either can be extended to support active-active with the help of more protocols (802.1q VLANs in the case of STP and Cisco's HSRP instead of VRRP) doesn't mean the statement was inaccurate.

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INTRANET ADVISER

Daniel Blum

Out of the desert, into OASIS

What should we make of these hardball maneuvers?

July 2003 ushered in a strong Microsoft offensive on the identity management and Web services standards front. In partnership with IBM and other vendors, Microsoft released WS-Federation specifications for federated sign-on, attribute services and pseudonym services — specifications that partially conflict with standards from the Organization for the Advancement of Structured Information Standards and Liberty Alliance. In addition, Microsoft and IBM let it be known that they reject Service Provisioning Markup Language, which OASIS produced and most identity management vendors have adopted. What should we make of these hardball maneuvers?

The good news is that WS-Federation and other Microsoft-inspired Web services specifications (collectively dubbed WS-*) feature what appears to be an open, composable and extensible architecture for Web services. WS-* embraces Security Assertion Markup Language (SAML) messages as tokens, offering an olive branch for convergence. And Microsoft and IBM say they plan reasonable and non-discriminatory licensing for the specifications. From these standpoints, WS-* will help bring Web services and federated identity closer to critical mass.

The bad news is that when it comes to identity management, WS-* is under-specified and only one of its components has been submitted to a standards body. Microsoft and IBM say they need more time to perfect WS-Federation, WS-Trust, WS-Policy and other specifications before submitting them. But I've heard concerns that the vendors are looking for a rubber stamp while delaying submission risks, freezing important OASIS standards work or freezing the market for federated identity.

WS-*'s theoretical "best" should not become the enemy of SPML and Liberty Alliance's "better." While SPML schema and protocols are not loosely coupled enough to become the be-all, end-all Web services provisioning standards, they are a strong step forward for interoperable account provisioning. And Liberty Alliance's opt-in account linking has immediate applicability to multiple business-to-consumer and business-to-employee identity-management scenarios in today's mature installed base of browsers, Web servers and portals. Liberty's identity-federation specifications are a good start. The work now beginning at OASIS to combine SAML with Liberty, and enhance both, should go forward to create a powerful and extensible identity-federation architecture for customers.

Even today, federated identity solutions based on SAML are proliferating, reducing sign-ons and help desk calls, and bringing ROI to early adopters. You should feel comfortable moving forward with SAML for browser-based, federated sign-on, and with OASIS-compliant WS-security header technologies that let Web services transmit SAML or other tokens such as Kerberos tickets. Also evaluate Liberty's Phase 1 Identity Federation. And join others in the industry in pushing for immediate submission of Microsoft and IBM's WS-* identity-management-related specifications to OASIS so that the SAML 2.0 group and Liberty Alliance can move forward with their important work.

Blum is senior vice president and research director with Burton Group, an integrated research, consulting and advisory service. He can be reached at djb-feedback@earthlink.com.



CACHE ADVANCE

Linda Musthaler

Spam bills have unlikely supporter

No matter the shortcomings of the current crop of legislation, I welcome anything that is done to try to limit this beast we call spam.

There's something wrong with proposed anti-spam legislation when one of the country's foremost spammers supports its passage. In May, self-proclaimed "e-mail mass marketer" Ronnie Scelson testified before the U.S. Senate Committee on Commerce, Science and Transportation in a hearing about possible spam legislation. He supports bills that are wending their way through Congress.

Most would agree that laws are needed to limit unsolicited commercial e-mail. In the current absence of a federal law, at least 30 states have passed or are considering spam legislation. However, because e-mail doesn't stop at state lines, trying to address the issue on a state-by-state basis is futile. Some would argue that simply addressing spam on a national basis isn't enough and that we need an international treaty governing spam.

Take heart, for our federal legislators are attempting to act on the problem. In the 108th Congress, there are no fewer than nine bills under consideration by the Senate or House of Representatives. Among them are the Anti-Spam Act of 2003, CAN-SPAM Act of 2003 and Reduction in Distribution of Spam Act of 2003. (For summaries of the pending legislation, go to www.nwfusion.com, DocFinder: 7128.)

With all the attention lawmakers are giving to anti-spam laws, you'd think that the owner of Scelson Online Marketing would be running scared. On the contrary, he says the bills legitimize his business and protect him from the bullying tactics of anti-spam groups.

The crux of the issue is the opt-out provision. Most of the legislative proposals allow for the existence and distribution of commercial e-mail, as long as there is a provision for recipients to opt out of receiving further notices from that sender or his agents.

From a consumer standpoint, that means that you or I must respond to each piece of spam to initiate the opt-out procedure with that particular sender. The fact is, opting out is more work than simply deleting the message.

From the marketer's standpoint, the opt-out procedure lets him weed out the people who absolutely aren't interested in his messages, leaving him with "good" addresses. It also makes it perfectly legal to continue to send messages to people who don't say "take me off your list."

Long lists of anti-spam groups, including the Coalition Against Unsolicited Commercial E-mail and JunkBusters, oppose the legislation based on the premise of opt-out.

Other countries, including Australia, are going to the other extreme, saying that recipients must opt in to a mass marketer's mailing list. For a spammer, getting intended recipients to opt in is a heck of a lot harder than letting them opt out. That's one reason Scelson and other e-mail mass marketers like the U.S. proposals.

Scelson raised some interesting points during his testimony to Congress. He says that ISPs have blocked his mail, and thus "the individual has lost the right to get any e-mail he wants." OK, it's a stretch, but I can buy that. I'm not sure I want MSN or AOL deciding which e-mails I should get.

Scelson also says he and other marketers like him simply will move offshore if their businesses are regulated too harshly in the U.S. This threat underscores the fact that e-mail is a global phenomenon and it must be looked at on a global basis. No matter the shortcomings of the current crop of legislation, I welcome anything that is done to try to limit this beast we call spam. We need to start taking legislative baby steps and then amend the laws later if they are found to be ineffective. The cost of dealing with spam has become astronomical. I don't deny Scelson and his peers the right to make a legitimate living in this country. However, you and I, and our employers and ISPs, shouldn't bear the brunt of the cost of his business, and we shouldn't be forced to receive his messages if we don't want them.

Musthaler is vice president of Currid & Company, a Houston technology consulting firm. She can be reached at linda@currid.com.

FIRST IN A MULTI-PART SERIES

UCSF's up-tempo upgrade

Network director wins funding for major upgrade of San Francisco campus network. Now his team faces tough design issues and tight deadlines.

■ BY JEFFREY FRITZ, DIRECTOR OF ENTERPRISE NETWORK SERVICES, UCSF

By any measure, the enterprise network at the University of California, San Francisco, is a big one. It has 20,000 nodes, 15,000 switch ports, three Class B licenses (192,000 IP addresses), and encompasses three medical campuses and four hospitals in San Francisco, plus more than 100 remote campuses and regional clinics throughout California.

The network is heterogeneous, with devices from 3Com, Avaya, Cisco, Enterasys Networks, Foundry Networks and Nortel. The network backbone is multi-protocol (IP, IPX/SPX, AppleTalk), and there are multiple routing protocols (Open Shortest Path First [OSPF], Enhanced Interior Gateway Routing Protocol [EIGRP] and Routing Information Protocol). The core of the network is a SONET ring at the Parnassus Heights main campus, and most San Francisco sites connect to it over ATM.

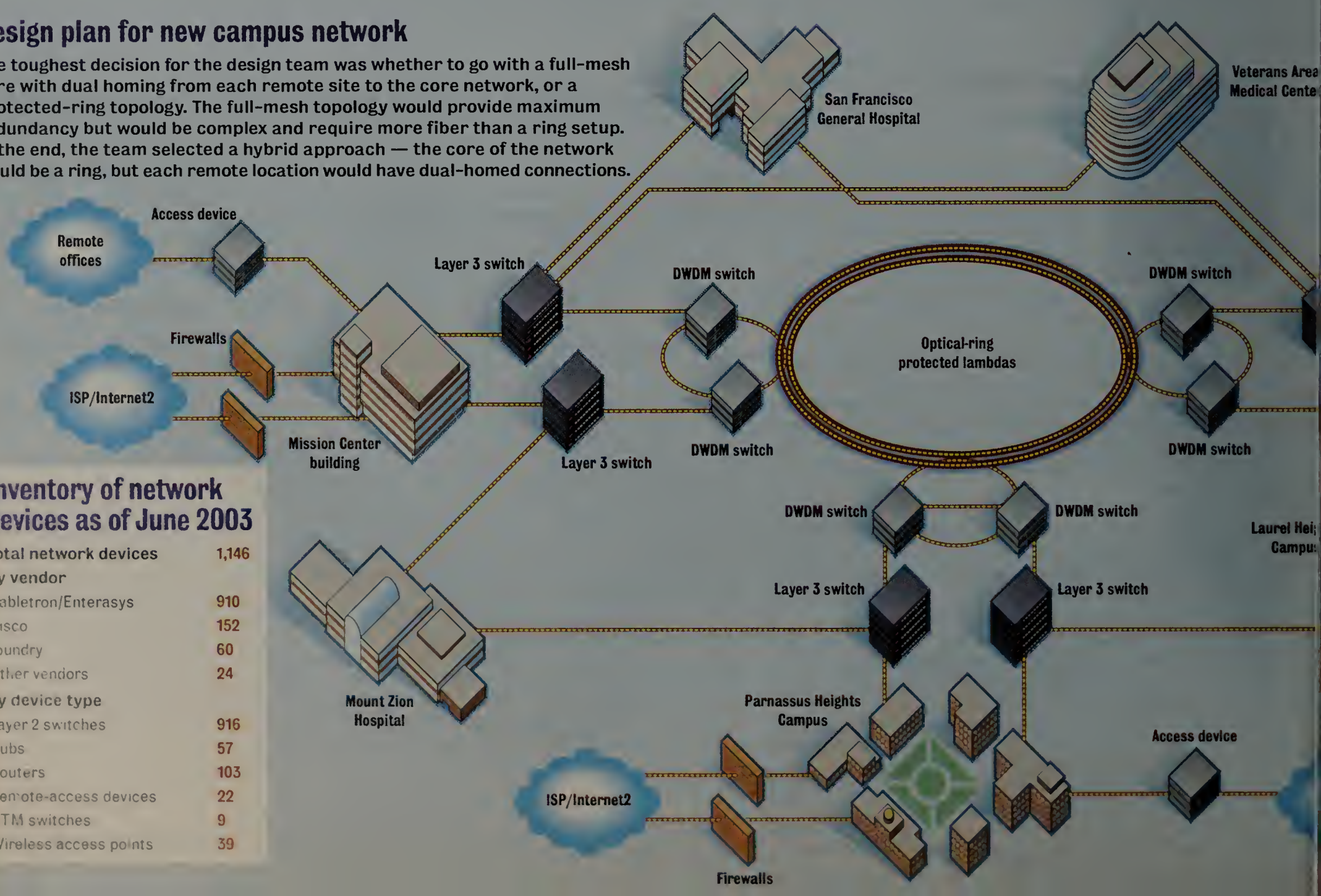
The complexity of this infrastructure makes life difficult for the six-person network operations center staff. They must have an intimate knowledge of multiple switch/router operating systems, multiple protocols and multiple network monitoring applications. The way things stand today, it could take hours to detect an intrusion attack and days to react to it.

Not only that, the network infrastructure is becoming obsolete. Some devices are 11 years old — well exceeding their three- to five-year life spans. Some of the cabling is Category 3 or older.

And from a design perspective, the network topology no longer makes sense. Devices were reverse-engineered

Design plan for new campus network

The toughest decision for the design team was whether to go with a full-mesh core with dual homing from each remote site to the core network, or a protected-ring topology. The full-mesh topology would provide maximum redundancy but would be complex and require more fiber than a ring setup. In the end, the team selected a hybrid approach — the core of the network would be a ring, but each remote location would have dual-homed connections.



Inventory of network devices as of June 2003

Total network devices	1,146
By vendor	
Cabletron/Enterasys	910
Cisco	152
Foundry	60
Other vendors	24
By device type	
Layer 2 switches	916
Hubs	57
Routers	103
Remote-access devices	22
ATM switches	9
Wireless access points	39

into the network over time on an as-needed basis, causing the network to have no "flow" in its topology and little rhyme or reason in its design.

Instead of a well-groomed lawn, the network looks like weeds in a garden. While the university briefly considered upgrading the network slowly over time, it soon became obvious that nothing less than a full-blown, immediate network upgrade would do.

Building the business case

Network architects are reluctant salespeople, but we realized that we were going to have to put our technologist hats aside and become marketing gurus, spreading the word about the need and the vision for a UCSF Next Generation metropolitan-area network (NGMAN).

Enterprise Network Services put together the business case, which was vetted by Ken Orgill, CIO and assistant vice chancellor for IT Services. Before a Chancellors' retreat in May, a briefing was sent out describing the NGMAN plan. We also put together a PowerPoint presentation describing the current network, the need for the NGMAN, and the estimated costs and benefits to the campus. One key point was that having a new network with far fewer routers and switches likely would reduce operating costs.

Enterprise Network Services (ENS) members also spoke with influential campus users, gained support from the campus Computer Support Coordinators and actively promoted the NGMAN to key campus technology groups such as UCSF IT Governance Network Subcommittee.

Orgill made a formal presentation at the Chancellor's Retreat, and all the work paid off handsomely with a multimillion-dollar allocation spread over three years. Chancellor J. Michael Bishop approved our proposal in June, saying, "UCSF is a first-rate medical institution with a third-rate network. Now let's do something about this."

Determining the network applications

We were elated to have received quick approval for our proposal. But our joy was short-lived when we noticed the tight time frames that had been handed to us. The go-live date and migration of the first users had to occur within 14 months of project approval. Migration of all users to the new network had to be completed in 12 to 18 months after the NGMAN went live.

Fourteen months isn't a long time to implement a top-down network redesign, especially with a four- to five-month RFP process ahead of us. We needed to determine the major requirements and key network applications within a few weeks.

We began by examining the current network applications, talking to end users and doing a little judicious forecasting. The medical center, School of Medicine, medical researchers and library IT staffs helped identify potential applications, such as medical imaging distribution (MRI, CT scans), and remote clinician consultation/diagnosis.

IP telephony, distance learning and high-definition video distribution were also obvious applications. Secure e-mail and transfer of research, patient, doctor and student information also were pegged as key applications. On top of that, all network-based medical applications had to comply with the Health Insurance Portability and Accountability Act.

Culling this together gave us a pretty good base from which to forecast the network applications that would need to be supported over the NGMAN.

The design team

Once we had established the underlying network applications, and thus the nature of the network, it was time to put together a design team.

No one knows better how a network design should operate than the people charged with installing and operating the network. Therefore, all four ENS units (Enterprise Architecture Design, Network Operations, Enterprise Project Management and Enterprise Production Services) were included.

From the beginning, we determined that the best way to get user needs incorporated into the design and achieve user buy-in was to involve technical members of the user community. Consequently, representatives from the medical center, School of Medicine, School of Nursing, medical researchers and library IT staffs joined the design team.

The team also included volunteers from the technical staffs of three major vendors: Cisco, Foundry and SBC. It was a bit tricky to orchestrate their participation because of vendors' conflicting interests. But the vendor technical staffs promised to play fair, and for the most part they did. We made sure that they did not participate in the RFP creation or award decision process — and their involvement had to cease before a California law limiting vendor involvement in design efforts took effect on July 1.

However, their participation was worth the effort. They called on technical resources unavailable to us, making them a valuable addition to the team.

There was one other important team member — Material Management, the UCSF procurement unit. These are the folks who know how to purchase the equipment and services needed for a project of this nature.

Altogether there were 16 people on the team. The size of the group meant that we had to be especially considerate of each other and work to keep the design moving ahead expeditiously.

The sky is the limit

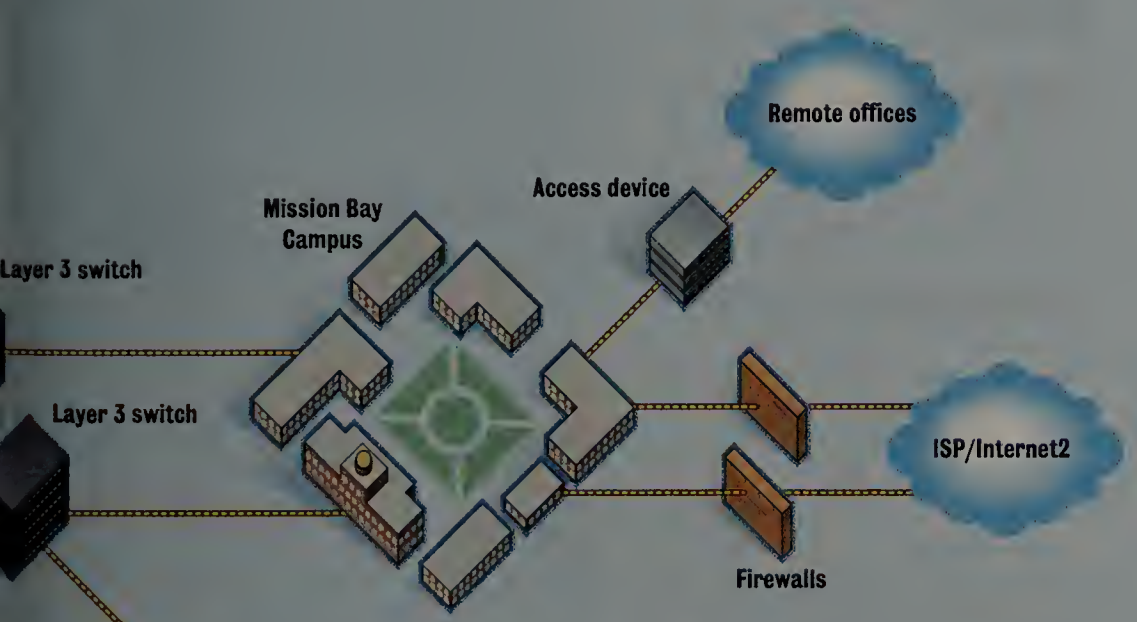
The best designs come from a combination of blue-sky dreaming and slice-and-dice reality. During the blue-sky process, there are no practical limitations, cost is no issue, and the resources are infinite. No one is critical of any idea. This lets the designers be as creative as possible. Once the list is as comprehensive as it is likely to be, the slice-and-dice phase begins. Here the designers become critics, hacking away at impractical or inordinately expensive items on the list. Because everyone is allowed to be a contributor to the blue-sky process and a critic during the slice-and-dice phase, no one's ego is on the line. If conducted properly, the result is the best possible design elements.

Before the design process could begin in full force, several decisions had to be made. The previous network used a SONET transport. There's nothing inherently wrong with SONET, but in many ways, SONET is showing its age. It is somewhat limited in scalability, only supports one lambda (light wave) and usually requires a managed service from the provider.

The option of converting from SONET to coarse wavelength division multiplexing or even dense WDM was extremely attractive. It would let the UCSF network staff manage its own Layer 1 transport, increasing or decreasing the bandwidth and number of lambdas (optical channels) as required. And it would provide multiple virtual fiber pathways over one pair of fiber strands, meaning far fewer fiber pulls in the future.

The existing network uses an ATM backbone. While the technology still makes sense in a service provider's network, the complexity of ATM makes it unwieldy in an enterprise network. The simplicity of Gigabit Ethernet, combined with its ever-growing bandwidth (1G and 10G byte/sec today, and the promise of 40G byte/sec tomorrow) made it a natural. That made the decision to go with Gigabit Ethernet in the core network a no-brainer.

There was a plan underway to take the existing network from multi-protocol to single protocol. We saw no



Next-generation MAN design criteria

Optical core

- Redundancy.
- Self-healing.
- Multiple lambdas (DWDM).

Layer 2, Layer 3

- IP only (single protocol) backbone.
- Standards-based protocols only.
- 1G-byte Ethernet backbone (10G-byte Ethernet ready).
- 1G-byte Ethernet to building distribution points (10G-byte Ethernet ready).
- Stateful awareness, re-routable backbone.

System

- Low network latency (end-to-end).
- Minimal jitter.
- Scalability.
- COS.
- Modularity (no forklift upgrades).
- Robust network management, including Layer 1 monitoring.
- Out-of-band management.
- UPS providing a minimum of 20 minutes holding time for all network devices.
- 24-7 technical support with four hours on-site part delivery every day of the year.

Note: Core is defined as the optical L1 infrastructure. Backbone is defined as the L2-L3 IP network.

reason to deviate from this plan. The new network would be all IP.

Furthermore, Layer 3 ASIC-based switching offers the speed advantages of bridging at Layer 2 with the intelligence of routing, so we made the core network Layer 3 switched. As for the core protocol, we divorced ourselves from Cisco's proprietary EIGRP and went with OSPF.

To manage or not to manage

We had settled on Gigabit Ethernet riding over some flavor of WDM. Now we had to refocus on Layer 1. Would it be managed or unmanaged?

UCSF doesn't have the staff or expertise to descend into the depths of the city's manholes to splice or pull fiber. Therefore, everyone agreed that a service provider should manage the physical fiber infrastructure. However, the design team was divided on whether the lambdas should be managed.

Some team members favored unmanaged (dark) fiber. They said managed lambdas would be limiting, because changes generally have to be submitted ahead of time to the service providers. They argued that adding capacity could require contract and service-level agreement renegotiation in addition to long lead times.

Other team members said they believed managed lambdas would make our task easier because we could leave it up to the service provider to handle the light waves. They were concerned about the additional training required if we went the unmanaged route. They noted that it wasn't clear whether we could even obtain dark fiber at every location in San Francisco that we needed to connect to the NGMAN.

We agonized over this decision for several weeks and finally decided to offer vendors the opportunity to bid on both managed and unmanaged fiber solutions. This affords us a closer look at the pluses and minuses of each approach as part of the RFP responses.

Topology selection was nearly as controversial as the managed lambda decision. For the ultimate in reliability, some team members preferred a full-mesh core with dual homing of the Building Distribution Facilities (BDF) that serve as connection points between the campus buildings and the core network. Others preferred a protected ring configuration. They said a protected ring was nearly as redundant, was less complex and required less fiber than a full mesh. The discussions got quite heated at times.

To resolve the issue, the group was arbitrarily split into two teams. Each team of eight people was given a week to create a design.

A week later both groups put their designs side by side on white boards. Each argued the relative advantages of their configuration and pointed out weaknesses in the other team's topology. Both teams created strong designs, and, frankly, either would have sufficed as a decent backbone design. But in listening to the arguments it quickly became clear to that the best solution was a hybrid design that included elements of both topologies. The final topology selected was a protected ring core with dual-homed connections from the BDFs.

What's next

In the second part of this series — to be published in about three months when the RFP process is completed — we will talk about the implementation of the RFP, vendor selection, pre-installation testing and the issues we encounter as we take the design from whiteboard to procurement.

Fritz is the director of Enterprise Network Services for the University of California, San Francisco. He is the author of Remote LAN Access: a guide for networkers and the rest of us and Sensible ISDN Data Applications. He can be reached at jfritz@its.ucsf.edu.

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NetworkWorld Review

EMC CELERRA NS600 NAS DEVICE

EMC offers high-end NAS features at a mid-range price

■ BY BETSY YOCOM AND DIANE POLETTI-METZEL, NETWORK WORLD GLOBAL TEST ALLIANCE

With its Celerra NS600 network-attached storage system, EMC has pulled some of its high-end NAS technology down into a mid-range device aimed at enterprise users who want to consolidate 10 to 20 departmental and branch-office storage servers onto a single system.

Based on EMC's proprietary Unix-based Data Access in Real time (DART) operating system, the NS600 supports a number of features typically reserved for high-end NAS devices, such as extensive hardware redundancy and high-availability measures.

With its $162,00 price tag for 1 terabyte of capacity, the NS600 offers an alternative to competitive products that can cost more than $250,000.

The NS600 is a rack-mounted system with multiple components. The front end of the system is housed in the Data Mover Enclosure (DME), which has two Data Movers, each supporting six auto-negotiating 10/100/1000M bit/sec interfaces.

The Storage Processor Enclosure (SPE) supports 2G bytes of storage RAM and dual-active storage processors (2-GHz Pentium III Prestonia CPUs). The SPE manages the NS600's RAID 5 arrays, which reside in a separate enclosure. Having the Data Movers and SPE in separate enclosures ensures that if there is a disk failure, the SPE can provide the data needed to rebuild the disk without affecting data processing power within the Data Movers. In our tests, this worked as advertised.

We tested a system with 30 disks, but the NS600 can support up to 120. In addition to the RAID 5 disks, the NS600 comes with another hot spare replacement for any disk that might fail within the cabinet.

N+1 back-up power is stored in its own component (the DME and SPE each have their own dual power supplies, as well). A separate hot standby power supply for the storage processor allows data in cache to be written to a special area called a vault so that it is not lost during a system failure.

Connections between the major front-end and back-end components are via 2-gigabit Fibre Channel links.

Fail Safe Networks (FSN) are a key availability feature on the Data Movers. They allow 10/100/1000M bit/sec Data Mover ports to be configured in redundant mode to fail over to a secondary connection if the primary connection fails. FSNs can be configured a variety of ways — in sets of two to eight ports, as Ethernet channels or in link aggregations. All connections in an FSN share a single media access control and IP address.

To test FSN, we configured Data Mover ports 0 and 1 as the primary and secondary network interfaces through a pull-down menu and then pulled the cable on port 0. The failover to secondary Port 1 was instantaneous. However, when Port 1 failed back to the primary Port 0, we observed a 49-second delay, which is high. Data written to the device during this delay would be lost. In our experience, instantaneous failover is optimal; more than 20 seconds is noticeable; 49 seconds is about the time we consider getting tech support on the issue.

This delay can be avoided by configuring the ports in standby mode. Once a port fails over to a secondary port, it will not fall back to the primary port (unless there is a failure in the secondary port, now acting as the primary).

The NS600 Data Movers can be configured in two modes: primary/primary and primary/standby. In primary/primary mode, both Data Movers are operational, allowing users to optimize performance by spreading the load between two systems. But a secondary system doesn't have a backup. In the event of major failure, file systems would have to be mounted manually on the available Data Mover.

In primary/standby mode, one Data Mover acts as the primary system; a second Data Mover would take over if the primary unit fails.

In our tests, failover from the primary to a secondary Data Mover took 90 seconds, which is high for a network device. No sessions were dropped, but there was delay in writing to the file.



EMC's NS600 is a cost-effective alternative to NAS devices that cost more than $250,000.

When we pulled a fan on the storage processor, there was a 19-second delay until operation resumed. Removing a fan on the Data Mover and pulling a disk from its enclosure produced no delays in operation in either component.

During our fail-over tests of the storage processor fans, we did not replace the primary fan after a failover to a secondary fan. After 2 minutes the storage processor shut down entirely. This was odd to us because the three fans are designed to be redundant. EMC says the shutdown was caused by a safety mechanism built into the system to protect against overheating. But with two fans still active, we're not convinced this safety feature should have kicked in.

Performance

Because of the limitation of the IOMeter performance-measurement tool we used in our tests and the number of client machines we had available for the test, we couldn't tax the NS600 to anywhere near its maximum capacity (60,000 TCP connections, according to EMC), but we did kick its tires to determine whether it performed as expected.

We ran two tests — one using an I/O block size of 8K bytes and another test with an increased I/O block size of 16K bytes to determine how processing larger block sizes affected the NS600. (Our I/O blocks consisted of emulated file server traffic with 20% write and 80% read data. Eight HP ProLiant machines supported two clients each.)

Results of the 8K-byte test were 10 msec latency and 10,224 I/Os per second, which equates to a throughput of 79.87M byte/sec. (To put these results in perspective in terms of capacity in recent tests we conducted of lower-end Windows-based systems, throughputs were 6.26 I/Os per second and 7.67M byte/sec.)

Performance results with 16K-byte block sizes came out as we expected. Latency was slightly higher (14 microseconds) and the I/O-per-second rate was slightly

Net Results

Celerra NS600 — OVERALL RATING **3.8**

Company: EMC, (508) 435-1000, www.emc.com **Cost:** $162,000 for one terabyte of capacity. **Pros:** Extensive hardware redundancy; very good performance; logically designed Web-based management. **Cons:** Relatively high failover time from primary to secondary data mover; overwhelming amount of data in Celerra Monitor; noticeable reduction in I/Os per second during SYN-flood attack.

The breakdown

Management and administration 25%	4
Performance 25%	4
Features 20%	3
Installation and ease of use 15%	4
Configuration 15%	4
TOTAL SCORE	3.8

■ **Scoring Key: 5:** Exceptional; **4:** Very good; **3:** Average; **2:** Below average; **1:** Consistently subpar

How we did it

We installed IOMeter (an open source workload generator) on eight HP ProLiant ML350 servers — each with at least two Pentium III/866-MHz processors and 1G byte of memory. Each server emulated two clients. The NS600 was configured in primary/primary mode, and 16 separate connections were created to serve as IOMeter's storage targets.

We ran two tests using a file server/client configuration, using 8K- and 16K-byte requests (consisting of 80% read/20% write data) that randomly accessed the test file.

In separate tests, we launched three denial-of-service attacks against the NS600 while IOMeter testing was in progress. For failover testing of the data movers, we removed power from the primary data mover, and recorded fail-over times. When testing failover on interfaces, we pulled the plug on the primary interface and recorded the fail-over time.

lower (9,017) because of it was processing the larger blocks. The throughput rate was 140M byte/sec, an increase we would expect to see with the larger block size.

Because all network equipment is subject to security threats, we ran two attacks against the product. When we threw an Internet Control Messaging Protocol flood denial-of-service attack against the Data Movers, the I/O-per-second rate dropped 3%; a Jolt2 attack against the NS600 caused a 4% drop in I/Os per second. Both are negligible, and in both cases the system continued operating. However, a SYN-flood attack on Port 445 (the Microsoft port and, therefore, most vulnerable to attack) created 42% reduction in I/Os per second, although, again, the system continued to operate.

Management and ease of use

The NS600 came pre-installed — EMC sent it to us racked, cabled and ready for operation — the only thing we had to do to get the system up and running was establish a static IP address on the storage controller using an installation wizard.

The wizard sets up communication with the browser, through which we set username, password and other parameters, such as static IP addresses on the Data Movers' interfaces.

The NS600 is managed through Celerra Web Manager. This Web Manager GUI is based on a logically designed tree structure; clicking on any item in the tree invokes screens from which we configured the Data Mover and storage systems control station. The GUI was easily navigated and intuitive, and included context-sensitive, online help. A Unix-oriented command-line interface also is supported.

An additional application called the Celerra Monitor lets you drill down into management data in greater detail. This works well, but provides an overwhelming amount of information.

The Celerra Monitor supports visual alarms. The NS600 also can be connected to a modem that will dial out to the EMC support group and report component failures so a technician can be dispatched to the site to fix the problem.

Yocom is managing editor and Poletti is test lab manager at Miercom, a network test lab and consultancy in Princeton Junction, N.J. They can be reached at byocom@miercomr.com and dpoletti@miercom.com.

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ProductPeek
A quick look at things for your network

WholeSecurity Confidence Online Enterprise Edition

■ BY MANDY ANDRESS, NETWORK WORLD GLOBAL TEST ALLIANCE

WholeSecurity's Confidence Online provides a layer of protection for known and unknown Windows clients remotely connecting to your network. The enterprise edition includes a fat client for VPN connections, a small-footprint ActiveX client that performs a security check on general Web connections and a Web-based management console for logging and alerting.



Confidence Online offers security for remote Windows clients.

Confidence Online is a heuristics-based product, examining processes running on the client system looking for suspicious activity — such as the use of a keystroke logger or a hidden window — without relying on specific signatures. If a suspicious process is identified, alerts are sent to an administrator and the offending process can be killed or just logged as an event. End users also can be sent to a specific Web site with further instructions.

The fat client is installed on a client system and runs continuously in the background. We did not see any performance degradation with this client. When a VPN tunnel is created, the client starts a scan on the system.

The ActiveX control is downloaded to unknown client systems when they request access to a specific Web site, ensuring the system does not have any back doors, keystroke loggers, or other malicious program to access logon passwords and other sensitive information that might be entered.

We first ran a number of Trojan and back-door programs WholeSecurity provided. Confidence Online successfully identified these programs on the test systems and took the defined action upon discovery. By contrast, our client anti-virus program did not successfully identify all of these programs.

Next, we visited a few nefarious Web sites that successfully installed spyware back doors on our test system. Confidence Online successfully identified the rogue programs and terminated them as configured. The anti-virus program running on the system did not identify these programs as problematic.

We then infected our test system with the Ratsou Trojan, which, among other things, changes client security settings, installs an Internet Relay Chat server and denial-of-service client, and changes the Windows registry so it is run at startup. Confidence Online did not identify any of the executables used by this Trojan as problematic, but our anti-virus product alerted us to the infection.

We also configured Confidence Online to kill any instance of Solitaire it found running on our test system, which it successfully completed. This feature allows corporate security managers to enforce policies that prohibit programs, such as file sharing or public instant-messaging programs, from running on systems.

Confidence Online provides an interesting approach to client security. It is scalable and easy to use, but our tests show that it should be used with a client anti-virus program to provide multiple layers of security for remote users.

Andress is president and founder of ArcSec Technologies, a security consultancy specializing in product testing and comparison. She can be reached at mandy@arcsec.com. She also is a member of the Network World Global Test Alliance. For more Test Alliance information, go to www.nwfusion.com/alliance.

Confidence Online

WholeSecurity
Austin, Texas
www.wholesecurity.com

Cost: $39 per user, which includes management server.

Pros: Fast and easy to deploy. Does not require constant signature updates.

Cons: Only works with Windows operating systems. Did not identify all malicious processes on test systems.

NetworkWorld Review

CISCO CATALYST 3750 STACKABLE SWITCHES

Cisco beefs up its stackable switch line with StackWise interconnect technology

■ BY JOHN BASS, NETWORK GLOBAL TEST ALLIANCE

With the introduction of the proprietary StackWise interconnect technology that ties its new line of Catalyst 3750 switches together, Cisco has filled the gap between its small, stand-alone Ethernet switches and its large, modular chassis and blade switches.

The Catalyst 3750 stack is a good fit for enterprise applications where a large chassis solution is not economically feasible, and smaller stand-alone switch products don't scale. That's what we concluded after we connected three Catalyst 3750s in a ring — you can connect up to nine boxes — and found that the ring provided up to 30G bit/sec throughput while maintaining low latency, condensed administration and management features, and increased redundancy.

Cisco offers four switch configurations in the Catalyst 3750 line — a 24-port 10/100Base-T switch with two small form-factor pluggable (SFP) uplinks, a 48-port 10/100Base-T switch with four SFP ports, a 24-port 10/100/1000Base-T switch and 24-port 10/100/1000Base-T switch with four SFP ports.

We tested the 24-port Fast Ethernet box tied to both 24-port Gigabit switches.

Rack and stack

The switches are interconnected using proprietary multi-pin connectors. Two of these connections per switch are needed to form a ring. The switch hardware load-balances all packets entering the switch onto both directions of the stack ring.

Even if a packet is destined for a port on the same switch it entered, it will be forwarded to the ring. The ring acts as the backplane for all the switches in a stack. In a full-ring configuration, Cisco says it can support 32G bit/sec of throughput.

If a stack cable or switch fails, the neighboring switches will sense the ring disconnect and terminate the ring on both sides of the fault. The ring can support 16G bit/sec in this fault state, Cisco says.

Our tests showed that ring throughput is 26G bit/sec for the smallest allowable packet size and 30G bit/sec for the largest packet size. This difference in bandwidth is most likely because of the extra header information tacked onto each packet entering the ring and the bandwidth used by the token to arbitrate access to the ring. When we introduced a fault in the ring by unplugging one of the ring cables, the ring bandwidth was measured to be about half of the full ring bandwidth, or 15G bit/sec with large packets and 13G bit/sec with small packets.

We also tested the ring configuration for increased latency. The Catalyst 3750 stack racked up a worst-case latency of 50 microsec, which is well below the threshold where latency-sensitive applications would be affected.

When you power up a Catalyst 3750 stack, a master switch is selected for the ring according to six criteria documented by Cisco. The first criterion is a user-defined master election priority. The ability to prioritize the master election process worked as expected. We defined which switch would always become master, which switch would become master if it fails and so on until one switch is left in the stack.

Stack and switch configuration and ongoing management are handled through two interfaces: a command-line interface (CLI) or cluster management services (CMS).

The CLI looks and feels like the standard Cisco interface with the addition of a few commands to configure stack options. The stack appears as a multiple card chassis with the typical hub/slot/port numbering convention. The master switch replicates the CLI to all the switches in the stack so that console port access shows the same information from any switch in the stack. The configuration files are unified for all switches. If the master switch fails, the new elected master will have the configuration for the entire stack.

To make sure all switches can implement all features known to the master switch, the master copies its software image to each switch in the stack if necessary. This removes the risk of a switch not having to handle a particular feature configured through the master switch. Because this copying process might infringe on software licensing, the administrator must make sure the proper number of software licenses has been purchased.

To unify the switch configuration, each switch in the stack is given an arbitrary ID number. This number is used when displaying the interface ports. We tested the ability to renumber the switch IDs. This worked as expected and made administrative tasks much easier.

The Java-based CMS supports many browsers, but it did not work on an Apple PowerBook running OS X.

CMS has two modes of operation: expert and guide. Expert mode basically replicates the configuration options found in the CLI. Guide mode provides configuration wizards that help configure the stack for complex functions such as quality of service and multicast routing. The wizards were useful but limited in flexibility.

One beneficial stack management feature is remote deployment. Once a stack is up and running on the network, any technician should be able to connect a new switch into the stack and power it up. At that point, the network administrator can configure the new switch without any local network configuration and remotely manage it.

While the performance, features and flexibility offered by the Catalyst 3750 bundle stack up very well, we pinpointed two troublesome spots. The master election and configuration unification processes do not handle multiple ring faults well. The stack system was designed to only handle one fault at a time. If two ring faults occur, the stack becomes two stacks each with a master of its own. After reconnecting the ring without a reboot, the master election process might not be able to resolve a new master. You can reboot the stack to remedy this issue. This shortcoming doesn't negate the usefulness of the architecture, but it's something to plan for if you deploy these switches in your network.

Because the switches have to keep up with things like master election, CLI replication, unifying the configuration, and other basic stack functions, the time it takes to reboot the switches is longer than you might be used to. A switch with no stack connections will reboot in about 2 minutes. A three-switch stack takes about 2 minutes and 15 seconds to reboot.

One very useful feature of the stack is cross-channel etherchannel configuration. This feature lets you configure multiple links to belong to the same logical link or bundle. These links do not have to belong to the same switch. Without the stack feature, link aggregation is restricted to ports on the same switch. This feature worked as advertised.

Bass is a senior technical staff member at North Carolina State University's Centennial Networking Labs in Raleigh, N.C. He can be reached at john_bass @ncsu.edu. Sangram Kadam and Aditya Shringarpure of CNL assisted with testing.

Bass is a member of the Network World Global Test Alliance, a cooperative of the premier reviewers in the network industry, each bringing years of practical experience on every review. For more Test Alliance information, go to www.nwfusion.com/alliance.

Net Results

Cisco Catalyst 3750 stackable switches

OVERALL RATING **4.40**

Company: Cisco, (800) 553-6387
Cost: Range in price from $6,990 to $10,990.
Pros: Offers 30G bit/sec, fault-tolerant stack interconnect ring; has replicated management interface.
Cons: Stack ring can handle only one failure reliably; reboot time is long.



The breakdown

Performance 40%	4
Configuration and management 30%	5
Scalability and redundancy 20%	4
Installation/documentation 10%	5
TOTAL SCORE	4.4

■ **Scoring Key: 5:** Exceptional; **4:** Very good; **3:** Average; **2:** Below average; **1:** Consistently subpar



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SAN smarts

IT managers say hands-on experience is the most effective way to learn about storage-area networks.

■ BY DENI CONNOR

Learning to install, configure and manage a storage-area network is a hodgepodge affair that is littered with hard-won experience and lessons learned, IT managers say.

"I have not been to a formal training class, but we have worked closely with our vendors to make sure our design is realistic and achievable," says David Bratt, technology architect for H. Lee Moffitt Cancer Center in Tampa, Fla. "I have definitely picked up a lot of knowledge by working hands-on with the hardware that makes up our SAN."

Bratt has a Hitachi Data Systems 9570 storage array connected with a Cisco MDS 9216 switch to Emulex and QLogic host bus adapter installed in Windows, AIX, Sun and Linux servers.

Storage concepts such as SCSI Logical Units (LUN), LUN masking and zoning is enough to confuse any network administrator. Storage is often divided into smaller pieces called LUNs, which then are assigned to one or more servers to give them exclusive use of the storage. Assigning servers to storage LUNs is called LUN masking. Zoning, on the other hand, is the grouping of servers and their assigned storage into domains that can be managed more easily.

Tom Clarke, director of technical marketing at Nishan Systems, agrees that customers need to get their hands on IP storage gear to really understand it. "Although some of the concepts are similar, the actual implementation will vary somewhat between vendors," he says. "There's enough variation between vendors that learning by hands-on configuration is the way to do it."

Like Bratt, many IT managers are learning alongside the vendor that installed, reconfigured or expanded the company's SAN.

"I learned 90% by doing, 10% from a vendor" says Rich Banta, senior enterprise systems engineer for St Vincent Hospital in Indianapolis. "The 90% part led to painful and expensive mistakes on occasion."

Banta didn't properly partition the fabric and then compounded the mistake by not masking LUNs when creating volumes on the SAN. "The new LUNs were presented to every server attached to the fabric, causing many of them to re-enumerate their volumes in Windows 2000 Disk Manager. That was an all-night clean-up," he says.

Banta has two SANs — an XIOtech Magnitude array linked by Brocade Silkworm 12000 and 2800 switches to servers containing QLogic host bus adapters, and a Compaq EMA 16000, Emulex host bus adapters and Brocade 2800 and 16EL Fibre Channel switches.

How would these managers fine-tune SAN training if they had to do it again, and what would they do differently?

"Three years ago, when I got into [the storage] business, there was not a lot of commercial training available," says Ken Walters, senior director for enterprise platforms at Public Broadcasting Service in Alexandria, Va. Walters has an IBM Enterprise Storage Server and FAStT arrays connected with Brocade Silkworm switches to Sun, HP and Windows servers containing Emulex or QLogic host bus adapters.

Storage vendors always have offered a litany of information on their Web sites, Walters says. "There are many more options available now, even from mainstream training companies such as Global Knowledge. The Storage Network Industry Association Web site is also a great resource for finding training, as well as tutorials and white papers," he says.



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Such resources will be useful for boning up on newer storage technologies such as provisioning and virtualization. Bratt says formal training is an option, but the H. Lee Moffitt Cancer Center probably will rely on publications and vendor documentation to educate its IT staff about emerging technologies.

"In addition, we have a good relationship with our vendors, and they have always been willing to talk with us about anything we have on our minds, as well as new products/technologies that are about to hit the market," Bratt says.

Another option is to consult high-technology publications. "I learned about SANs by reading a lot of books and articles on SAN technology and design," Bratt says.

Walters will depend on the same sources he did for installing his SAN. "I'll look to conferences, storage Web sites, magazines and [vendor] white papers," he says.



Ken Walters of PBS earned his SAN education through osmosis.

MICHAEL STUART

If these managers had a chance to do it over again, they'd do some things differently.

"Make sure that you have a good understanding of what the best practices are before you build and get outside help and review in designing your SAN," Walters says. "It is very important that you do not design and implement your first SAN without experienced consulting. Once you have built your SAN it's hard to go back and change things."

Mark Greene, senior systems engineer for IT Services at Capital Region Health Care in Concord, N.H., offers a surplus of advice.

"Spending some money on training upfront is a worthy investment in the time you'll save during implementation. The more hands-on you can get prior to installation, the better off you will be," he says.

Among his other tips: Schedule as much time as possible between SAN installation and data migration, and check with software vendors to see if they recommend certain configuration settings.

While initial training is important, Tom Gonzales, senior network administrator for a large credit union in Denver, says follow-up skills are also necessary in the event of a problem.

"Most of the knowledge transfer from the installing vendor was related to provisioning and volume management," Gonzales says. "More focus on routine maintenance and troubleshooting would have been nice." Gonzales has a Dell PowerVault SAN connected by a Cisco Fibre Channel switch.

And a final word for the SAN-wise. "Have patience," says Kent Smith, principal consultant for IPSO, a systems integrator in Wayland, Mass., who has an EMC SAN connected with InRange switches.

"Unless you source everything from one vendor, there will undoubtedly be idiosyncrasies in how things fit together. The only training I have seen is vendor-specific, and bridging the gaps between vendors is where the headaches lie." ■

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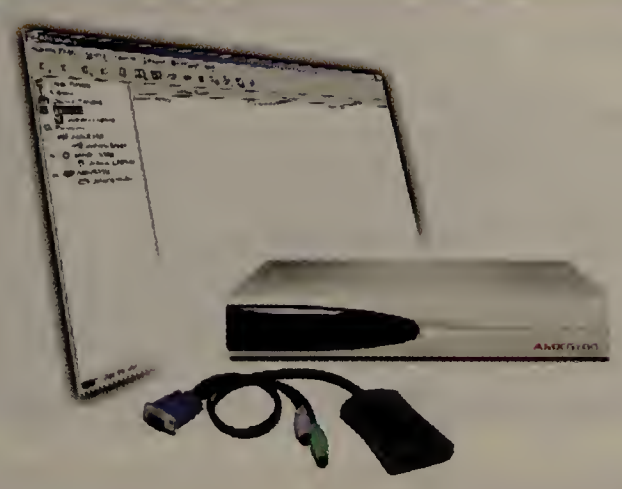
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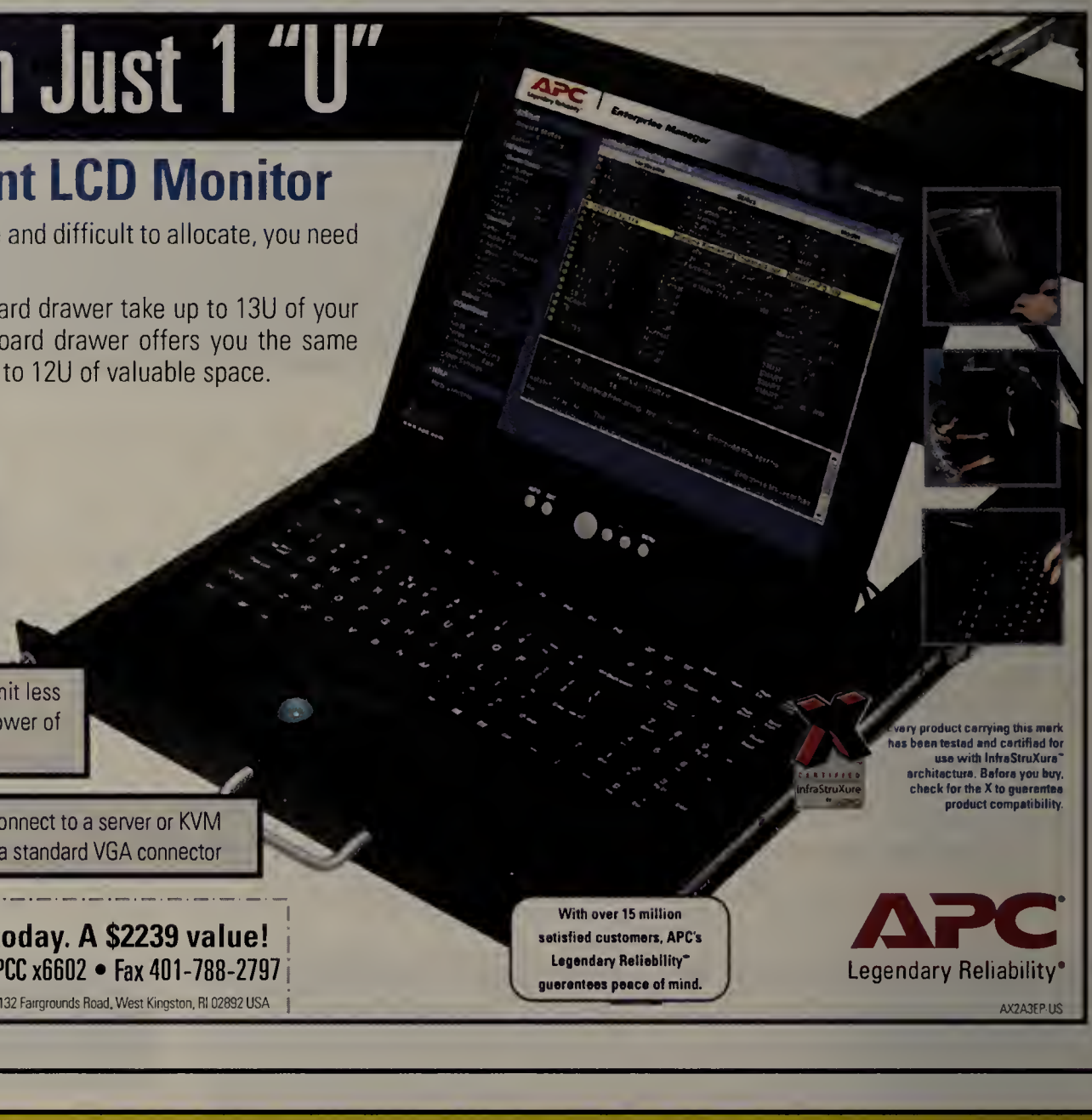
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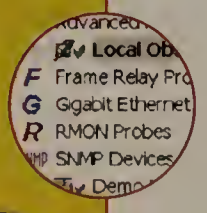
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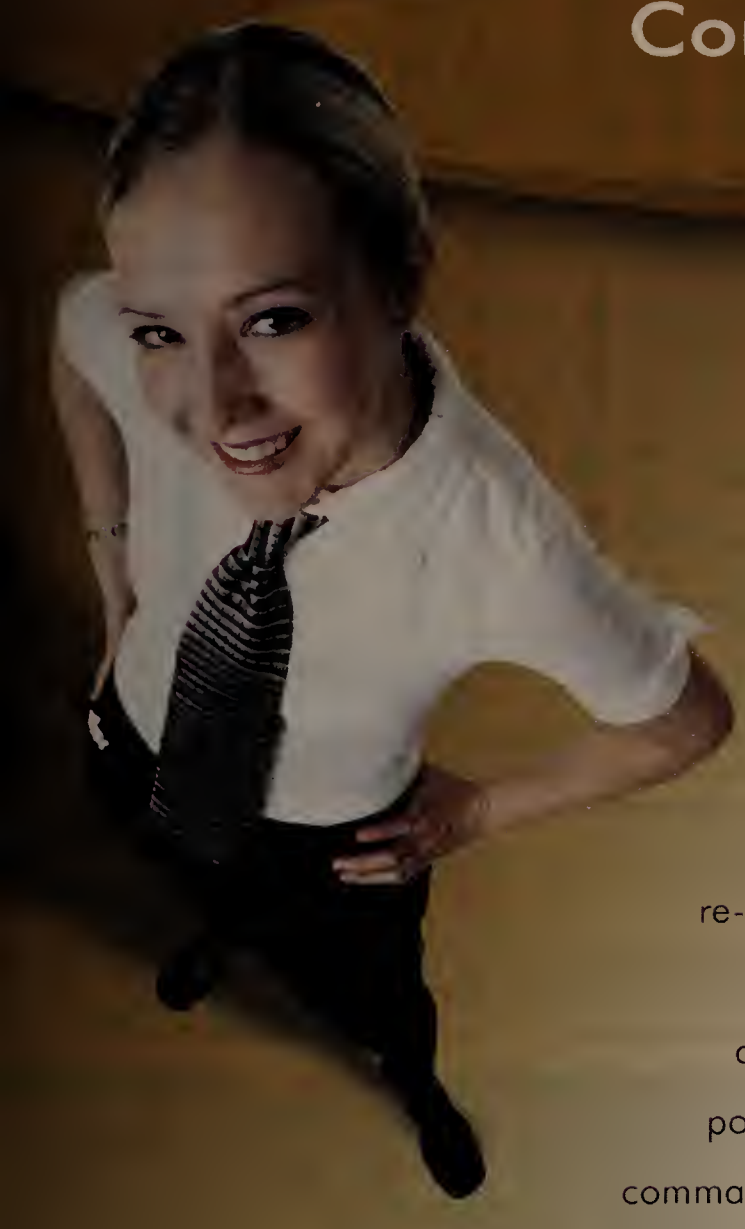
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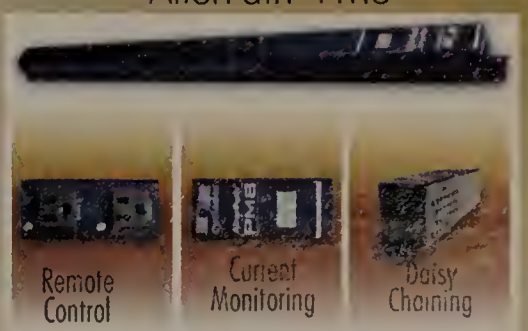
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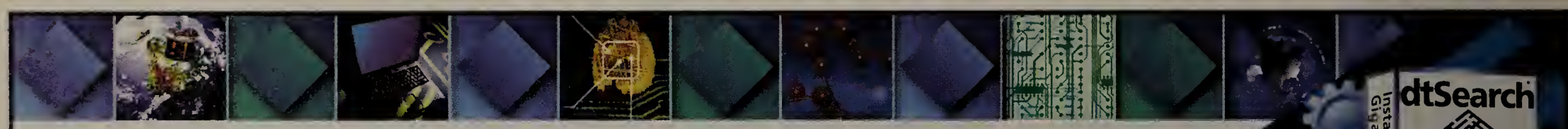
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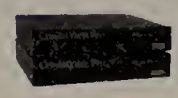
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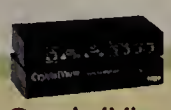
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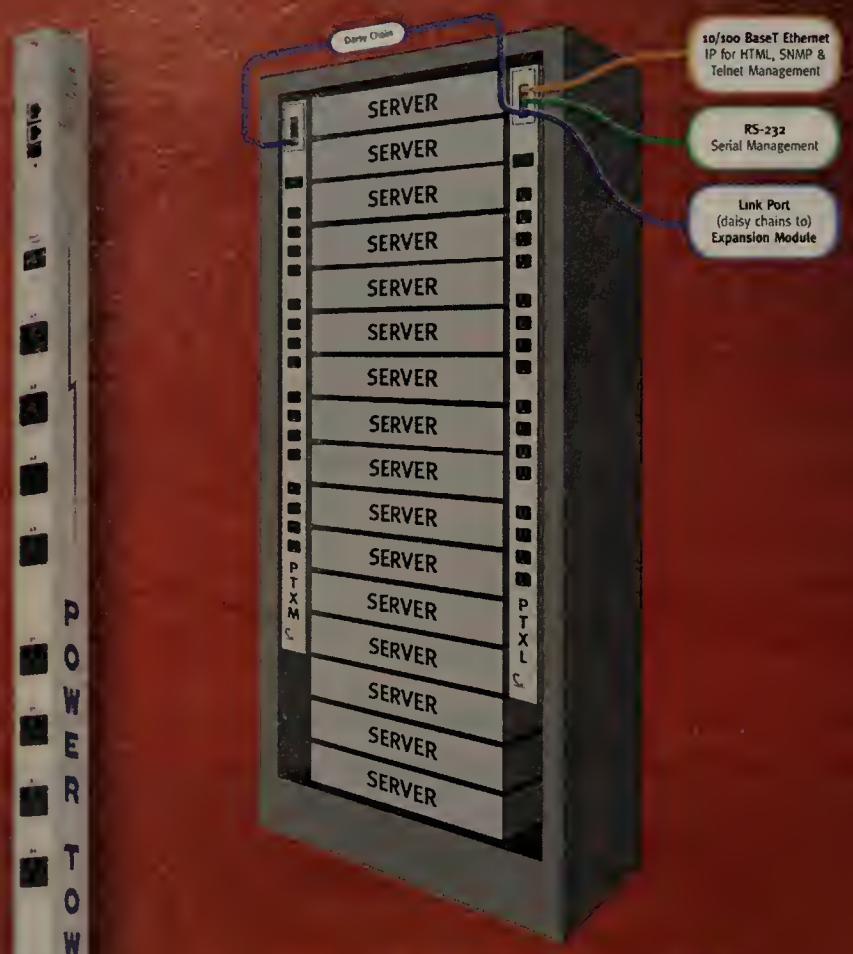
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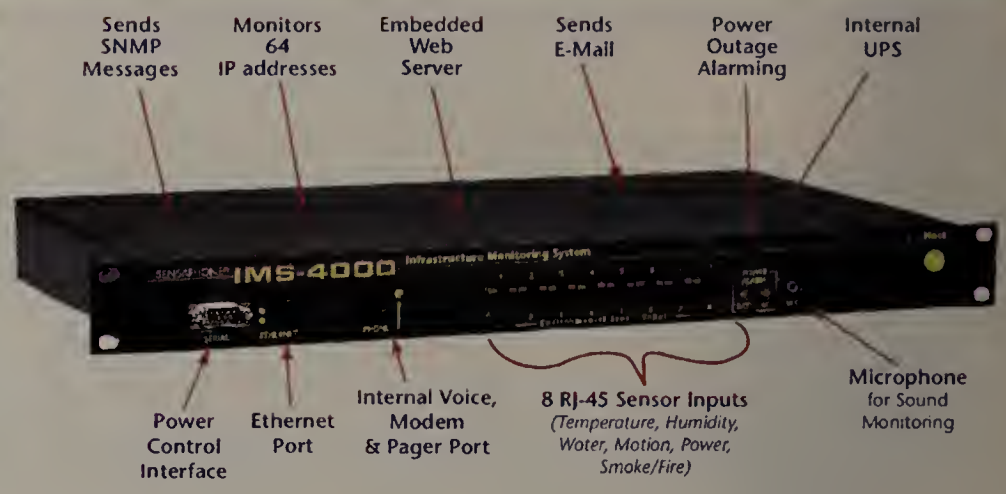
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The conference reflects BDPA's overall mission to open the doors of technology for African-Americans, from offering programs to expose families to technology to offering the latest in IT skills courses. The more than 40 chapters found throughout the United States offer programs ranging from the Homework 911 e-Learning hotline to Black Family Technology Awareness Week.

According to Milt Haynes, BDPA president and a feature release development manager at Lucent Technologies, that's why the conference agenda is far-reaching. Sessions range from the latest in wireless technologies and the role of IT in major current events to performance comparisons of .NET, XML and Oracle. "Our conference theme is Classroom to Boardroom, focusing on the fact that education is a life-long effort," Haynes says. "We have to start at the elementary school level to attract, mentor, coach and educate individuals for IT careers."

In addition to the highly technical sessions, the conference is offering workshops on a culture-specific approach to e-learning, the challenges for African American women in the IT workforce and how faith-based programs can assist in bridging the IT divide. Executive Pathways includes sessions designed to help IT professionals navigate their careers. As part of the conference, BDPA will also hold its annual career fair, this year featuring 30 major employers. Conference attendees will be able to take advantage of on-site career coaching on everything from resume writing to interviewing skills.



Haynes is watching over the conference as the outgoing president of BDPA. His goals have been simple – to build an infrastructure, to capture data on existing IT expertise among African Americans to pair up with hiring demand, to assist chapters in bringing the Classroom to Boardroom program to their communities and in growing the BDPA's entrepreneurial program.

"The biggest obstacle IT professionals face is in keeping current with the job market," Haynes, who also served on the Blue Ribbon Diversity Panel for ITAA, says. "We need to stay one step ahead of the learning." While outsourcing is a constant concern for IT professionals, Haynes believes the best and most challenging work is remaining in-house where IT professionals can work the customer-face aspect much better than any outsource provider. "Companies who are looking to the future want to keep development inside to maintain a strong workforce," he says.

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Software Engineer III: Work with engineers and chemists to analyze business needs, design, implement, test, modify and release client/server web applications to synthesize and optimize small molecules that have the potential to enter clinical development and become medicines. Provide technical support for chemists. Design and develop repository gateway for partners. Skills include: Java/J2EE, Python, Oracle, SQL, XML, HTML, Perl, Shell, JavaScript, C/C++, Windows, Linux, UNIX, SGI, chemical informatics toolkits and other development tools/platforms. Requirements include a Master's degree or equivalent in Computer Science, an Engineering discipline or closely related field. No work experience required. Applicants must have unrestricted authorization to work in the United States. Salary $66,000/year. 40 hours/wk. Respond with two copies of resume to Case #200202756, Labor Exchange Office, 19 Staniford St., 1st Fl., Boston, MA 02114.

ASSOCIATE IS ANALYST
Resp. for the dvlpmnt & deployment of SAP sys. for the co. Specific duties include: (i) gathering, dsgng, configuring, scripting, integrating & testing comp. scripts, interfaces & programs for a multi-landscape environment; (ii) documenting related interfaces; (iii) assisting Staff Consultants/SAP Sys. Analysts in evaluating user reqmnts for new or modified programs; (iv) utilizing all components of SAP dvlpmnt environment to combine pre-dvlpd software objects w/customized programming & to generate applns that are highly integrated w/the SAP R/3 sys.; & (v) providing tech. support to users of SAP programs. MS in Comp. Sci., Mgmt Info. Sys. or Bus. Must have working knowledge of UNIX, Perl, Cold Fusion sys. dvlpmnt life cycle as well as comp. hardware & operating sys. High mobility preferred. 40 hrs/wk, OT as reqd, 8 am - 5 pm, $64,240/yr. Qualified applicants please submit resume to: Manager, Beaver County Team PA Career Link, 2103 Ninth Avenue, Beaver Falls, PA 15010-3957. Please refer to Job Order No. WEB 346310.

BellSouth, a leader in providing local and cellular telephone, paging and mobile data services has multiple openings for the position of Systems Administrator in its Atlanta, Georgia office: Position requires relevant bachelor's degree or foreign degree equivalent and relevant experience.

For consideration, please forward your resume to: Ms. Lisa Burlingame, BellSouth, 2247 Northlake Parkway, Suite 800, Tucker, Georgia 30084. Please do not email or fax resumes EOE

Computer Support Spec.: Marietta, GA. Provide technical support; maintain commercial credit card information system; coordinate conversion to new hardware and software. Req'd: BS (or foreign equiv.) in Elec. Engin., Comp. Science or rel. field & 2 yrs exp. in job offered or as Programmer/Analyst. Resumes to: Fast Trip Corp., 640 Whitlock Av., Marietta, GA 30064.

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PROGRAMMER/ANALYST sought by NJ based Securities Dealer. Must possess Bachelor's or equivalent in Electronics Engineering or directly related field and 2 years exp. in software development/design and analysis, implementation and testing using J2EE, ASP, PL/SQL, RDBMS, Oracle, UNIX, Windows. Respond to: Human Resources Department #GLM-806RJ: Knight Trading Group, Inc., 525 Washington Blvd., Jersey City, NJ 07310.

Programmer: Develop/write computer programs & maintain company Artificial Intelligence systems using SICStus PROLOG, C++, Java, JavaScript, Win2000, Unix, etc. Also assist in the development & maintenance of company's proprietary middle tier software program. Req. BS in Com. Sc. or closely related field + 2 yr exp. in job offer or Software Engineering. Resume to Personnel Mgr, WebTone Technologies, 3535 Piedmont Rd, Ste 800, Atlanta, GA 30305

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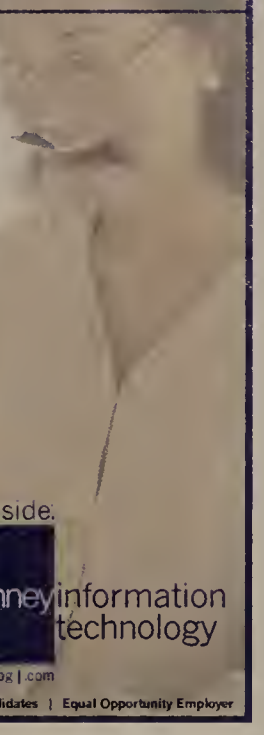
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Medical Database Systems Manager

Manages, administers, maintains, and configures a Unix/Linux/Windows/Mac LAN based client/server system including use of NIS and NFS to perform disk and file sharing with Samba system. Integrates multiple online/offline medical and genetic research databases and insures that such databases are capable of biology driven data mining. Requires a Bachelor's degree in Computer Science and one year direct experience. Send resume, no calls, to:

Medical College of Wisconsin
Attn: Employment Office-JMC0811
8701 Watertown Plank Rd.
Milwaukee, WI 53226
Fax: 414-456-6502

Consultant, Financial Business Systems to analyze complex IBM MVS mainframe based revolving credit card portfolio Vision 21 and Vision Plus software business systems and subsystems to direct team members in the design, development, implementation, and modification of software business systems to insure that systems enhancements such as late payment fee, skip payment, credit line underwnting, overlimit fees, and authorization match-off are properly integrated into the appropriate Vision based CMS posting system. Establishes parameters for daily batch cycles, supervises team members in coding for Vision Plus integration with VSAM database, and performs systems functionality analysis, unit testing and technical design of system including customization of system to meet various end users business analysis requirements. Requires Bachelor's Degree in Computer Science, Math, or any Engineering Field and three years direct experience. Work Location: 636 Grand Regency Blvd, Brandon, Florida. Send resumes only, no calls, to: Kathi Nogle, Household, 2700 Sanders Rd., Prospect Heights, IL 60070.

BellSouth, a leader in providing local and cellular telephone, paging and mobile data services has multiple openings for the following positions in its Atlanta, Georgia office:

Senior Software Developer
Software Engineer
Channel Analyst

All positions require a relevant bachelor's or master's degree or foreign degree equivalent and relevant experience including experience with Homebase software.

For consideration, please forward your resume to: Ms. Lisa Burlingame, BellSouth, 2247 Northlake Parkway, Suite 800 Tucker, Georgia 30084. Please do not email or fax resumes. EOE



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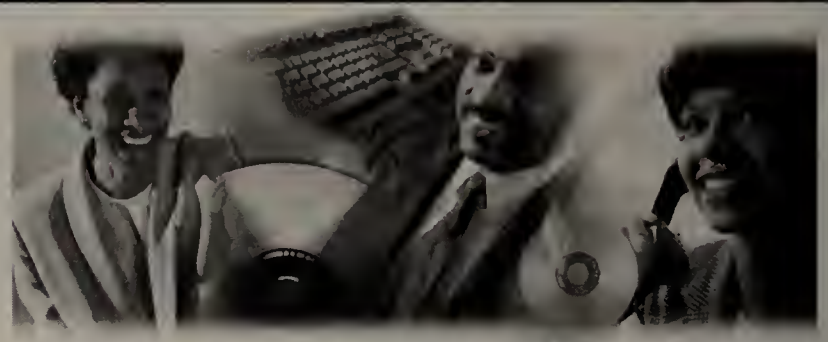


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Programmer/System Analysts, S/W Engineers wanted by Innovative Consulting. Candidates must have degree. Skills in Oracle, Java, SAP, SQL, VB, WebLogic/WebSphere & Unix will have preference. Travel required for some positions. Please send resumes to: info@icscorpusa.com.

Medical Data Processing is looking for system analyst, database administrator. Duties include design & implement web based medical billing software & systems. Qualified candidates must have minimum BS with experience using Java, Java Swing. Apply at leonard@mdp.com EOE

Prog/Analysts to analyze, design and develop s/w appls using Java, CORBA, XML, XSLT, HTML, Jscript, JDBC, etc. under Windows/UNIX OS; perform Enterprise Application Integration using Vitria BusinessWare; perform onsite/offsite maintenance, documentation, debugging, testing, and code optimization. Require BS or foreign equiv. in CS/Engg. (any branch) & 2 yrs of exp. in IT. F/T, High salary, travel involved. Resume to HR, Ordusion Technologies, Inc., 3883 Rogers Bridge Road, Suite 504, Duluth, GA 30097

Technical Leads needed. Seeking candidates possessing BS or equiv. and rel. work exp. Part of the req. rel. work exp. must include 2 years working with Unix and Oracle. Duties include: Plan and coordinate IT projects; Supervise and direct team. Work with Unix, RDBMS, Oracle, .NET Technologies and PL/SQL. Mail res., ref. and salary req. to: Computer Consulting Corporation, 10 W. Park Street, Metals Bank Building, Suite 612, Butte, MT 59701.

Sr. SW Engr.- Develop, integrate, maintain & test complex communication protocols including, but not limited to: Sigtran, SS7/CCS7 & ISDN. Participate in design & code reviews of new SW & modifica'ns to exist'g SW. Develop, maintain & test telecom applications & system SW responsible for configuring & controlling the system, internal communication between SW entities, fault tolerant & redundant operation of SW. Analyze & document computerized telecom system SW reqs., functional specs., architectural specs. & design specs. Must have M.S. in Comp. Eng'g, Comp. Sci., E.E. or equiv., + 2 yrs. exp. in job offered or 2 yrs. exp. w/telecom SW development. (Exp. may be gained before or after M.S.). In the alternative, employer will accept Bachelor's degree + 5 yrs. of progressively responsible post-grad SW development exp., including 2 yrs. telecom SW developmt. exp. Must have proficiency in C programming, as well as knowledge of telecom protocols. 40 hrs/wk; Salary: $92,833/yr. Send 2 copies of resume to: Case #200201646, 2002 Labor Exchange Office, 19 Staniford St 1st Fl, Boston MA 02114.

City of Ketchikan

Ketchikan Public Utilities Telephone Division is a rural, wireline telephone company (LEC) servicing over 8,000 customers with 2,000 lines.

KPU is currently looking for a person with knowledge of voice, data, and optical communication internetworking. Knowledge of AFC DSLAM & Telliant products would be a plus. Intimate knowledge of Switched Ethernet, IP Television, Routing Protocols, TCP/IP, and MPLS, is highly desirable. Exposure to DMS100 and wireless technology would be helpful. Candidate should be proficient in use of advanced diagnostic tools including NMS management tools. Must be able to work well in a team environment and provide leadership to work tasks. Minimum of 4-years work experience in IP IT is required, formal education preferred. This is a full time position contingent on six (6) month probation, $33.17/hr. plus benefits.

This position is open until filled. Complete job description and application available on the City's Website at www.city.ketchikan.ak.us or the City of Ketchikan 334 Front Street, Ketchikan, AK 99901, E-mail carolh@city.ketchikan.ak.us or Phone (907) 228-5631. EOE/AA.

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O Lytics Consulting Inc. seeks Software Dev't Eng'r in Wescosville, PA. Assist to develop applications incl. Oracle + Web applics (standalone + n-tier) Analyze software req's; work w/ eng team; dev testing, programming + docs; upgrades + maint. also db design + modeling Use technologies incl. UML IBM WebSphere, WebLogic, Java, J2EE, XML, ERP, Oracle, DB2, CRM, Jbuilder, Visual Age for Java, Toad, DBArtisan + Vantive. Must have Masters in Computer Sci. + 6 mos relevant exp. Resume to O Lytics, H R, 1011 Brookside Road, Ste 140, Wescosville PA 18106

Seeking qualified applicants for the following positions in Memphis/Collierville, TN Senior Programmer Analyst. Formulate/define functional requirements and documentation based on accepted user criteria Requirements: Bachelor's degree* or equivalent in computer science, MIS, math, engineering or related field plus 5 years of experience in systems/applications development. Experience with J2EE development using UML modeling; UNIX Scripting; and SQL Scripting also required *Master's degree in appropriate field will offset 2 years of general experience. Submit resumes to Sibi George, FedEx Corporate Services, 1900 Summit Tower Blvd., Suite 1400, Orlando, FL 32810. EOE M/F/D/V

Prog Analysts to analyze, design, code and maintain web/client server applications using Java, C, C++, CORBA, J2EE, HTML, Servlets, XML, Weblogic Server, IIS, Oracle, MS Access etc under Windows, Sun Solaris OS; perform automation of functional/regression testing with WinRunner, eTester and Astra Quick Test; provide on site maintenance support such as debugging, modifications, fine tuning & code optimization. Require: BS or foreign equivalent in CS/Engg(any branch) with 2 yrs exp in IT. High salary, F/T, Travel involved. Resume to: HR, Semafor Technologies, Inc, 3300 Holcomb Bridge Road, Suite 212, Norcross, GA 30092.

Programmer/Analyst, Must have Bachelor's in Computer Science or its functional equiv., and 2yrs exp. Oversee company technology system; analyze user needs, system capabilities. Install, upgrade software. Develop programs to improve production or workflow as req'd. 40 hrs/wk, 9AM-5PM. Competitive salary. Send resume to: USA Grocers Management, 7284 W. Palmetto Park Rd., Ste 101 South, Boca Raton, FL, 33433.

Computer Programmer, develop & write business apps computer progs. using Java, JSP, JDBC & SQL for documenting, data entry, retrieval & testing prog websites. Req: B.S. in Computer Science, Computer Engineer or Electrical Engineer. 40 hrs/wk. Job/interview site: San Bernardino, CA. Send resume to: Econo Lube N Tune, 1685 W. Kendall Dr, San Bernardino, CA 92407

Network Engineer: (2) Job location: Matthews, NC. Design, develop & implement software solutions. Analyze requirements for reservations sys., accounting, credit cards, payroll & personnel. Test procedures & perform network adm. Req.: Bachelor's deg. (or equiv.) in Comp Info. Sys. (or other IT field or related). Resume to: NDASR Investments, 1600 S. Hwy. 81/287, Decatur, TX 76234.

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TechNation Software Consulting, Inc, a software consulting company with its main place of business at Sioux Falls, SD has multiple positions for Software Professionals.

Sr. **Software Engineers**: BS in CS, or equivalent with more than 5 years of recent programming experience or MS in CS with more than 3 years of such experience. Duties entail programming, gathering user requirements and customization of software in either of a) Database Systems which involves database design, data modeling working in both front end as well as backend applications on Unix and Windows platforms. Or in b) systems side programming in Unix, C, C++ which involves product development, working on telecom protcols or development of device drivers.

Both positions require knowledge of allied Internet technologies like Java, JSP, XML, J2EE and ASP. **Unix Systems administrators**: BS in Computer Sciences or equivalent with atleast five years of experience in an enterprise environment. (i.e. more than 500 users) Duties include extensive use of Network Implementation and Administration, System Integration, Backup and recoveries, shell scripting and System Securities. Experience in Management of Enterprise Network Storage devices (SAN or NAS), HP and Solaris Servers, switches, HUBs and in Veritas NetBackup systems.

TechNation provides onsite consulting services to clients across the United States and hence a **key requirement** for all positions is that candidates must be willing to relocate across the country for periods between 3-6 months or as needed.

Send resumes to Rona Troff, 300 N. Dakota Ave. Suite #505-B, Sioux Falls, SD 57104 or email to rtroff@tnscinc.com. Fax: 530-733-2775.

IT Consultant: Roundarch, Inc. seeks an individual for its Chicago office to develop & deploy complex web content management systems (CMS) & portal systems for consulting clients using web-based development techniques & JAVA, HTML, DHTML & XML languages. Successful candidates will have a relevant Bachelor's degree in CS, EE or related and at least 4 yrs. exp. in software development consulting, at least 3 yrs of which is in web-based development of content management systems using HTML & XML. Resume to: Roundarch Inc., c/o Deloitte Consulting, attn Cathe Slocum, 2 Tower Center Blvd, East Brunswick, NJ 08816 or fax 732-296-6454.

Computer Support Specialist - Assist & maintain networked comp. system manag'g d/base, dvlpg customized reports thru integrated info system. Dvlp bilingual (Eng/Span) website & tech, SQL, applics & VB doc. Write interfaces & modify system to S. Amer format to meet needs of Latin Amer mkt. Train users. 35 hrs. 2 yrs coll Syst Engg or Info Syst (or for equiv) + 2 yrs exp. Fax resume & salary reqmts to Mr. Perez, (305) 275-4559.

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Senior Software Engineer: Design, develop, & implement off-the-shelf software solutions providing web-based billing & presentment, & account management using Java in a UNIX, Solaris, & NT shrink-wrapped development environment. Analyze & design software applications in n-tiered, web-based environment using OOA/OOD principles & UML modeling tools. Debug & solve complex problems in distributed environments using VisiBroker, C++, Netscape, Oracle, VisualCafe, VJ++, & Integrated Development Environment tools from Microsoft. Design, implement, & test relational database comprised of stored procedures & triggers to maintain data integrity with Oracle & MS-SQL. Implement GUI tools, elements in user interface & business logic using Java/XML, Visual Basic, C/C++ programming & Internet communications/security skills. Design, develop, & implement n-tier architecture solutions for internet based applications on Windows platform using IIS, ASP, SQL, & native Windows technologies. Bachelors degree (or foreign equiv.) in Comp. Sci/ Comp. Eng'g/Elect. Eng'g or closely related field, & 5 yrs of progressively responsible experience in job offered or as Software Developer/Eng'g. In lieu, will accept Master's degree (or foreign equiv.) in Comp. Sci/ Comp. Eng'g/Elect. Eng'g, or closely related field, plus 3 yrs of experience. Requires demonstrated expertise in completion of 2 full development cycles in Windows environ., including analyzing & designing software applications using OOA/OOD principles & UML modeling tools, & demonstrated expertise in analyzing various legacy print stream data file formats, including Advanced Function Presentation, MetaCode, DJDE, & PDF, as well as architecting solutions for extracting & manipulating data. 40+ hrs/wk; 8a-5p (M-F); $90,500.00/yr. Submit resume in duplicate to: Case #200202545, Labor Exchange Office, 19 Staniford St, 1st fl, Boston, MA 02114. EOE

SOFTWARE, Sr. Systems Analyst. Complete Business Services in SF, C++, Java, ASP, Silktest (or equiv). Test/develop software systems and products. MSCS/IS. 1 yr. exp. Salary $80,890. Fax resume (415) 584-5226.

Programmer Analyst needed w/exp in using Sybase, MS SQL Server, Erwin, CAST, Rational Rose, VB, MS Access, JAD, RAD, Sun Solaris & Windows 2000. Send resumes to: Triple Point Tech., Inc., 301 Riverside Ave., Westport, CT 06880. No in Person Resumes.

Senior Software Developer to participate as high level technical expert in the design, development, coding, testing, and debugging of financial distributed applications including. Centralized Transaction Module for trade processing, High Volume Client Transactional Web Applications, and Depository Trust & Clearing Corp. and Federal Reserve and Legacy applications. Utilize Rational Suite of products for design and Web-based solutions for development. Specifically, design and develop enterprise-wide applications services using Java J2EE application server, IBM MQ middleware solutions, and Oracle database systems. Develop applications for real-time systems using Java, HTML, Javascript, Shell Scripts, XML, XSLT, and PL/SOL. Work on UNIX, Windows NT, and SUN OS operating systems, and use Java, C++, and C languages. Also assist junior Software Developers to implement technical designs and support development processing including database design. Requirements: Master Degree in Computer Science, Engineering or a closely-related field and three (3) years experience in job offered or three (3) years experience as Software/Systems Engineer OR Bachelor Degree and five (5) years progressive experience. Candidate must also possess demonstrated expertise designing and developing enterprise-wide applications services using Java J2EE application server, middleware solutions, and Oracle database systems; demonstrated expertise designing and developing applications using Rational Unified Process and WebGain Studio tools; demonstrated expertise developing IBM MO based applications involving exchange of data between Legacy and UNIX systems; and, demonstrated expertise developing applications for real-time systems using Java Servlets, Shell Scripts, XML, XSLT, HTML, and PL/SQL. 40+ hours/week, 9:00AM to 5:00PM, $86,300/year. Submit two (2) copies of resume to Case #200202570, Labor Exchange Office, 19 Staniford Street, 1st floor, Boston, MA 02114. Must have proof of legal authority to work permanently in the U.S.

Programmer, Engg & Sc., 8a-5p, 40 hrs/wk. Formulate tech'l specs for mechanical & industrial processes/procedures automation & applics; prep detailed workflow chart for input, output & logical operations; test systm; prep tech'l documentation; prgm websites using client-server technology, e-commerce application dvlpmt, Java, EJB, JSP & XML. Bach or equiv deg w/major in Info Systms, Comp Sci or Engg, Electronics, Electrical, Mechanical, Industrial or related Sci/Engg. 1 yr exp in job or as comp prof'l w/above skills. Resume to: GTS, Inc. 3761 Venture Dr., Bldg. 100, Suite #240, Duluth, GA 30096.

Telephony Solutions Developer: BS + 2 yrs exp to incl Dialogic GLobalCall, ATL, Visual C++, Visual Studio.NET, SQL Server, COM/DCOM, Brooktrout RealCT SDK & call processing on digital & analog circuits req. Systems Analyst: BS + 2 yrs exp to incl Visual Studio, SOL Server, Visual C++, ATL. Exp reqd in documenting scope & dsgn, dvlpmt & deployment of NET solutions req. Both pos req MCSD & demonstrated business communication skills as well as verifiable refs for above reqmts. Apply to jobs2003@a-t-g.com, Des Moines, IA

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BackSpin Mark Gibbs



Rotten to the core

"We are in the process of rebuilding our ethics program and understand that there is still more work to do."
— Michael Capellas, Chairman and CEO, MCI (Associated Press)

I was going to follow up last week's column on solving the spam equation with a discussion of anti-spam technologies but we'll get to that next week. This week I want to talk about the MCI affair.

As if cheating in its accounting wasn't enough ($11 billion for Pete's sake!), the Justice Department is now investigating accusations that MCI defrauded other telephone companies of hundreds of millions of dollars by routing long-distance calls as local calls as well as diverting other calls via Canada to avoid paying U.S. local carrier access fees.

And as if that wasn't serious enough, now the government's General Services Administration (GSA) has suspended all new business with MCI after its own investigation concluded that MCI "lacks necessary internal controls and ethics."

Because the GSA is the part of the government responsible for negotiating and acquiring pretty much anything that federal agencies require, this is a serious turn of events. The feds spend more than $1 billion with MCI annually, and while existing contracts will be continued, there will be no new business until MCI can demonstrate that it has changed.

Which raises an interesting question: Can MCI be salvaged? I use the term "salvage" because there's so much rot in the body of the company that words like "redeem" or "cure" are not applicable.

The problem is that corporate personalities, just like the personalities of individual humans, are hard to change. For example, have you ever tried to lose weight? Then you know how hard it is to break your habits. You can have the best of intentions and then someone says "Hey, want an ice cream?" and before you know it you're sitting on the sofa with a giant tub of Ben & Jerry's Oatmeal Cookie Chunk.

Corporations are the same. They get used to providing bad service (a peculiar talent of telecom companies), taking shortcuts, padding bills and that becomes standard procedure.

Worse still, the bigger the company the harder it is to stop the creep of moral rot. It just gets deeper and deeper into the organization and harder to expose.

So what to do with MCI? I'd suggest that we break them up, sell them off, anything but allow them to be another rotten apple in the big-business barrel.

Let me be clear: I am not anti-big business per se, but when a company of such incredible size and power is rotten to the core it is essentially dangerous to our culture. Not only does it destabilize financial markets but it destabilizes the businesses it serves.

And for the IT groups, there's an important question to take away — how rotten is your company and are you part of the problem? These days IT is almost always involved or aware of every aspect of business that matters.

Presuming the latest MCI allegations are true, you would think some non-management technical guys were aware that something wasn't kosher. And if that's the case, and they didn't blow the whistle, then they sold their souls.

You could argue that people in this kind of situation fear losing their jobs, but that isn't a good enough argument. Being involved in a crime isn't just a risk to your livelihood. It's also a risk to your career, your credibility and your personal integrity.

And there's always the risk of being found an accomplice with all the legal consequences that might entail.

Which leads to another takeaway: How carefully do you vet those you do business with? Are your partners and suppliers on the up and up or will you be dragged into their dishonesty and immorality?

And the bigger the business, the more that rottenness can be hidden. In business, never underestimate how quickly rottenness will reach to the core.

Tell me you're clean at backspin@gibbs.com.



'NetBuzz News, insights, opinions and oddities

By Paul McNamara

You wondered about this, too

After seven years of writing about spam, one unanswered question has continued to nag at me above all others: Do spam recipients actually cough up their credit card numbers to purchase those pills that promise to — how shall I phrase this? — increase a fellow's bandwidth in the bedroom?

My presumption has been that, sure, people are stupid and somebody must . . . but the sales figures have to be smaller than the purchasers' collective self-esteem. The resultant revenue certainly cannot justify the volumes of this particular type of spam, which taken at face value would appear to place the penis-enlargement industry somewhere between the auto manufacturers and the airlines in terms of size.

No, my working theory has been that the money to be made from penis-enlargement spam derives not from actual sales of penis-enlargement products, but from getting other aspiring spammers to pay for help in sending their own penis-enlargement spam; a phallic derivative of the classic pyramid scheme, if you will.

So who's guarding that list of things Buzz has been wrong about? We've got yet another entry to make.

It turns out that spam does sell men hope that "herbal supplements" can give them what genetics did not. This is true at least according to a fascinating glimpse into the books of one spammer published last week in *Wired* and written by Brian McWilliams (www.nwfusion.com, DocFinder: 7141).

"An order log left exposed at one of Amazing Internet Products' Web sites revealed that over a four-week period some 6,000 people responded to e-mail ads and placed orders for the company's Pinacle herbal supplement," McWilliams writes. "Most customers ordered two bottles of the pills at a price of $50 per bottle. Do the math and you begin to understand why spammers are willing to put up with the wrath of spam recipients, Internet service providers and federal regulators."

Do the math and you also begin to understand why law enforcement will never be any more effective in curbing spam than it has been in eradicating pot: There's far too much money to be made, an inexhaustible supply of individuals willing to give the business a go . . . and customers galore.

According to the story, Pinacle purchasers included at least two company presidents, a mutual fund manager, a restaurateur, a veterinarian and a chiropractor (who is not exactly the poster child for back-crackers being real doctors). And lest you begin to believe that only men could be this gullible, be aware that "numerous women" were reported to be among the customers.

It gets worse. The Web site these folks entrusted with their MasterCard, Visa or American Express failed to supply so much as a telephone number, physical address or e-mail box . . . which might pose a problem if you've got a question about whether you should mix your Pinacle with your Viagra.

You say you want to know about the site's security and encryption provisions?

Please. You already know the answer to that one. The company has calculated that its customers don't have time for such worries when they're preoccupied with bigger things.

One customer told the story's author that he judged the Web site to be worth a shot because it included one of those "As Seen on TV" logos.

I was going to compare this with dropping your credit card on a crowded city street, but at least in that instance there's a chance it might be picked up by a good Samaritan.

The good news is that the story reported no instances of fraud or identity theft against these foolhardy souls.

The bad news? Whatever sex these reckless individuals *are* having is probably not of the safe variety.

Got a one-liner of your own? Don't be shy. The address is buzz@nww.com.



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